BNL-77378-2006

Laboratory Directed Research & Development Program Assessment For FY 2006

Annual Report

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES
UPTON, NEW YORK 11973-5000
UNDER CONTRACT NO. DE-AC02-98CH10886
UNITED STATES DEPARTMENT OF ENERGY

December 2006

DISCLAIMER

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Introduction

Brookhaven National Laboratory (BNL) is a multidisciplinary laboratory that carries out basic and applied research in the physical, biomedical, and environmental sciences, and in selected energy technologies. It is managed by Brookhaven Science Associates, LLC, (BSA) under contract with the U. S. Department of Energy (DOE). BNL's total annual budget has averaged about $460 million. There are about 2,500 employees, and another 4,500 guest scientists and students who come each year to use the Laboratory's facilities and work with the staff.

The BNL Laboratory Directed Research and Development (LDRD) Program reports its status to the U.S. Department of Energy (DOE) annually in March, as required by DOE Order 413.2B, "Laboratory Directed Research and Development," April 19, 2006, and the Roles, Responsibilities, and Guidelines for Laboratory Directed Research and Development at the Department of Energy/National Nuclear Security Administration Laboratories dated June 13, 2006.

The goals and objectives of BNL's LDRD Program can be inferred from the Program's stated purposes. These are to (1) encourage and support the development of new ideas and technology, (2) promote the early exploration and exploitation of creative and innovative concepts, and (3) develop new "fundable" R&D projects and programs. The emphasis is clearly articulated by BNL to be on supporting exploratory research "which could lead to new programs, projects, and directions" for the Laboratory.

As one of the premier scientific laboratories of the DOE, BNL must continuously foster groundbreaking scientific research. At Brookhaven National Laboratory one such method is through its LDRD Program. This discretionary research and development tool is critical in maintaining the scientific excellence and long-term vitality of the Laboratory. Additionally, it is a means to stimulate the scientific community and foster new science and technology ideas, which becomes a major factor in achieving and maintaining staff excellence and a means to address national needs within the overall mission of the DOE and BNL.

The LDRD Program Assessment Report contains a review of the program. The report includes a summary of the management processes, project peer review, and the portfolio's relatedness to BNL's mission, initiatives and strategic plans. Also included is a metric of success indicators and Self Assessment.

Management Process

PROGRAM ADMINISTRATION:

Overall Coordination:
Overall responsibility for coordination, oversight, and administration of BNL's LDRD Program resides with the Laboratory's Director. Day-to-day responsibilities regarding funding, oversight, proposal evaluation, and report preparation have been delegated to the dedicated Scientific Director (SD) for the LDRD Program who now reports to the Assistant Laboratory Director for Policy and Strategic Planning (PSP). The Office of the Assistant Laboratory Director for Finance (ALDF) continues to assist in the administration of the program. This includes administering the program budget, establishment of project accounts, maintaining summary reports, and providing reports of Program activities to the DOE through the Brookhaven Site Office Manager.

At BNL, the DOE approved LDRD Program budget has been significantly increased over the past ten years from $2.0 million to $15.0 million. This allows the Laboratory to prepare itself for work in emerging areas of research.

Program Structure:
The program consists of two categories of projects, Competed LDRDs and Strategic LDRDs (S-LDRD), which combined, meet the overall objectives of the LDRD Program.

Competed LDRDs - Proposals are solicited annually for review and approval concurrent with the next fiscal year, October 1. An LDRD Selection Committee, comprised of the Associate Laboratory Directors (ALD) for the Scientific Directorates, an equal number of scientists recommended by the Science Council, plus the LDRD Scientific Director, and the Assistant Laboratory Director for Policy and Planning, review the proposals submitted in response to the solicitation.

The competed LDRD category emphasizes innovative research concepts with limited management filtering to encourage the creativity of individual researchers. The competition is open to all BNL staff in programmatic, scientific, engineering, and technical support areas. Researchers submit their project proposals to the LDRD Scientific Director.

Strategic LDRDs - A portion of the LDRD budget is held for the Strategic LDRD (S-LDRD) category. These funds are used to establish and enhance initiatives that are consistent with Laboratory priorities. Projects in this category focus on innovative R&D activities that are likely to develop new programmatic areas within BNL's mission responsibilities and enhance the Laboratory's science and technology base. The Laboratory Director entertains requests or articulates the need for S-LDRD funds at any time.

These Projects are driven by special opportunities, including

- Research project(s) in support of a laboratory strategic hire,
- Evolution of Program Development activities into research and development activities,
- ALD proposal(s) to the Director to support unique research opportunities,
- Research project(s) in support of laboratory strategic initiatives as defined and articulated by the Director.

Allocating Funds:
There are several decisions to be made each year concerning the allocation of funds for the LDRD Program.

These are: (1) the amount of money that should be budgeted overall for the Program; and (2) the amount to be allocated between the two categories (3) finally, how much, should go to each competing project or proposal. All of these decisions are made by senior-level management.

For each upcoming fiscal year the Laboratory Director, on recommendation by the Deputy Director for Science and Technology (DDS&T) and the Assistant Laboratory Director for Policy and Strategic Planning (PSP) and in consultation with the ALDF, develops an overall level of funding for the LDRD Program. The budgeted amount is incorporated into the Laboratory's LDRD Plan, which formally requests authorization from the DOE to expend funds for the LDRD Program up to this ceiling amount.

The majority of projects are authorized for funding at the start of the fiscal year. However, projects can be authorized throughout the fiscal year, as long as funds are available and the approved ceiling for the LDRD Program is not exceeded.

The actual level, which may be less, is determined during the course of the year and is affected by several considerations including: the specific merits of the various project proposals, as determined by Laboratory management and the members of the LDRD Program Committee; the overall financial health of the Laboratory; and a number of budgetary tradeoffs between LDRD and other overhead expenses.

Competed LDRD Selection Process:
Responsibility for the allocation of resources and the review and selection of proposals lies with a management-level group called the Laboratory Directed Research & Development Program Committee. For Fiscal Year 2006, the Program Committee, which selected the 2007 programs, consisted of eleven members. The Scientific Director of the LDRD Program chaired the Committee, and the other members were the Assistant Laboratory Director for Policy and Strategic Planning (PSP), five Associate Laboratory Directors (ALDs), and five members from the scientific departments and divisions (S).

2006 COMPETED LDRD PROGRAM SELECTION COMMITTEE

Leonard Newman	Chairperson (SD)
J. Patrick Looney	Assistant Laboratory Director for Policy and Strategic Planning (PSP)
Ralph James	Energy, Environment & National Security (ALD)
Peter Bond	Nuclear & Particle Physics (Interim ALD)
Steven Dierker	Light Sources (ALD)
Doon Gibbs	Basic Energy Sciences (ALD)
Fritz Henn	Life Sciences (ALD)
Dmitri Kharzeev	Physics (S)
Lawrence Kleinman	Environmental Sciences (S)
Ronald Pindak	Light Source (S)
David Schlyer	Medical (S)
Trevor Sears	Chemistry (S)

Request for Proposals:
The availability of special funds for research under the LDRD Program is well publicized throughout the Laboratory. This is done using two methods -- one occurring at yearly intervals, the other occurring irregularly. Each year a call letter is sent by the SD for LDRD to the Scientific Staff and as a separate memorandum to all the Associate Laboratory Directors and Department Chairpersons. The FY 2007 call memorandums issued in March 2006 are attached as Exhibit A. The call references the BNL LDRD Standards-Based Management System (SBMS) Subject Area, which is available to all employees on the web and is attached as Exhibit F. The other method is through a feature article in The Bulletin or Monday Memo. The FY 2007 announcement was issued in the March 13, 2006 Monday Memo, see Exhibit G. The process that solicits and encourages the development of proposals also identifies the current Laboratory Strategic Focus Areas which are of special interest to Laboratory management.

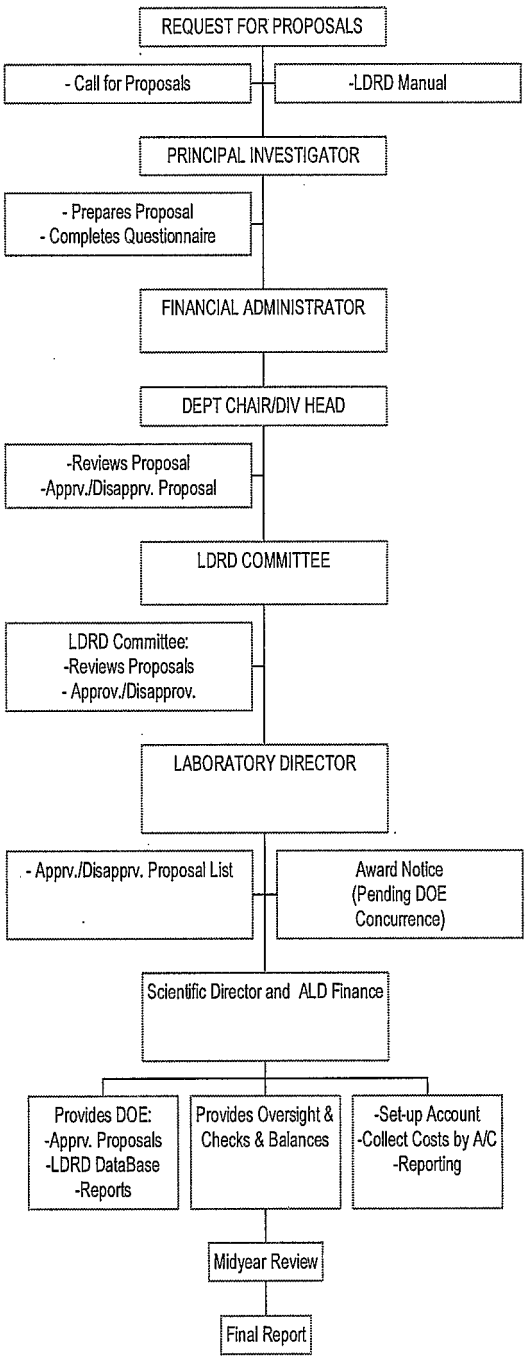
The LDRD SBMS Subject Area specifies the requirements necessary for participation in the program. It states the program's purpose, general characteristics, procedures for applying, and restrictions. An application for funding, i.e., a project proposal, takes the form of a completed "Proposal Information Questionnaire," Exhibit B. An application must be approved through the appropriate management levels, which includes the initiator's Department or Division Budget Administrator and the Department Chairperson or Division Head.

The Chairperson or Division Head reviews the Proposal Information Questionnaire for completeness. This includes the review of responses to questions on National Environmental Policy Act (NEPA) and Environmental Safety and Health (ES&H). Also, ensure that the principal investigator's regularly funded programs are not impacted by the LDRD project.

The applications are then forwarded to the LDRD Program Committee for full review and consideration for funding.

Proposal Review:
Once the cognizant line managers approve the proposals, they are forwarded to the Chairperson of the Committee (SD for LDRD) who transmits a copy of the abstracts of all proposals received to the Committee for review. The Committee considers all proposals that have met certain minimum requirements pertaining to the Department's and BNL's LDRD policies.

Competed LDRD Projects Program Process



Lead proponent responsibility of a proposal is assigned to that Associate Laboratory Director of the Committee who oversees and directs the technical area from which the proposal originated. One other ALD and an S serve as second proponents. The SD and the PSP serve as third proponents for all of the proposals. All of the above receive for review, the full proposals for which they are responsible.

A description of the process is outlined in the Figure on the previous page. See Exhibit D for the instructions to the LDRD Selection Committee. All members have several weeks to review the proposals and prepare for a full debate on each proposal. The DOE Project Manager is present during the Committee evaluation sessions as a non-voting member.

Selection Criteria:
Minimum requirements for each proposal are: (1) consistency with program purpose; (2) consistency with missions of BNL, DOE, and NRC; (3) approval by Department Chairperson and/or Division Head, and cognizant Associate/Assistant Director; (4) assurance of satisfactory continuation of principal investigator's regularly funded programs; (5) modest size and generally scheduled for 2 years but limited to no more than 3 years; (6) will not substitute for, supplement, or extend funding for tasks normally funded by DOE/NNSA other users of the Laboratory; (7) will not create a commitment of future multi-year funding to reach a useful stage of completion; and (8) will not fund construction line-item projects, facility maintenance, or general purpose capital equipment.

The selection criteria used to evaluate and rank individual proposals are stated in broad terms. While the LDRD SBMS Subject Area clearly states that selection is based on (1) scientific or technological merit, (2) innovativeness, (3) compliance with minimum requirements, (4) proposal cost as compared to the amount of available funding, and (5) its potential for follow-on funding. The requirements of DOE Order 413.2B are also carefully considered during the selection process to ensure that proposals are consistent with DOE criteria.

Project Approval:
All proposals are rated by the full Committee and then discussed with the discussion of the lower rated proposals kept to a minimum. The Committee selects the highest priority proposals, by concurrence, for detailed discussion. Final selections are made by a vote of the ALDs as recommended for funding. Some funding may be held in reserve earlier in the fiscal year so that funds remain available for proposals submitted at later dates. The funding amount requested in any one specific proposal may be changed or adjusted during the approval process. The Committee's recommendation is then submitted to the Laboratory Director for approval. After approval by the Director all new projects are submitted to the DOE-Brookhaven Site Office (DOE-BHSO) for concurrence by the DOE Project Manager prior to start. The ALDF then sets up a separate laboratory overhead account to budget and collect the costs for the project.

Strategic LDRDs Selection Process:
Responsibility for the allocation of resources and the review and selection of proposals lies with the Assistant Laboratory Director for Policy and Strategic Planning, Deputy Director for Science and technology and the Laboratory Director.

Request for Proposals:
The availability of special funds for research under the Strategic LDRD Program is disseminated by the Laboratory Director to the Associate Laboratory Directors.

The LDRD SBMS Subject Area specifies the requirements necessary for participation in the program. It states the program's purpose, general characteristics, procedures for applying, and restrictions. An application for funding, i.e., a project proposal, takes the form of a completed "Proposal Information Questionnaire," Exhibit B. An application must be approved through the appropriate management levels, which includes the initiator's Department or Division Budget Administrator and the Department Chairperson or Division Head.

The Chairperson or Division Head reviews the Proposal Information Questionnaire for completeness. This includes the review of responses to questions on National Environmental Policy Act (NEPA) and Environmental Safety and Health (ES&H).

The applications are then forwarded to the LDRD Scientific Director for full review and consideration for funding.

Proposal Review:
Once the cognizant line managers approve the proposals, they are forwarded to the LDRD Scientific Director. The LDRD Scientific Director examines the proposal for compliance with the LDRD requirement as stated in DOE Order 413.2B and the LDRD SBMS Subject Area.

This includes the Scientific Director arranging for the appropriate peer review in accordance with the Director's guidance utilizing the S-LDRD Review Instruction.

Project Approval:
After completion of review the projects are then submitted to the Laboratory Director for approval. After approval by the Director all new projects are submitted to the DOE-Brookhaven Site Office (DOE-BHSO) for concurrence by the DOE Project Manager prior to start. The ALDF then sets up a separate laboratory overhead account to budget and collect the costs for the project.

Project Supervision:
The SD for LDRD carries out overall supervision of projects for both categories. Supervision over the actual performance of LDRD projects is carried out in the same way as other research projects at the Laboratory. Each principal investigator is assigned to an organizational unit (Department, Division) that is supervised by a chairperson or manager.

Each chairperson or manager is responsible for seeing that the obligations of the principal investigator are satisfactorily fulfilled and that the research itself is carried out according to standard expectations of professionalism and scientific method. The SD monitors the project's status, schedule, and progress and coordinates with the chairperson or manager as necessary.

The SD organizes a mid-year review of all projects. Each PI presents a progress report on the status of their project. In attendance are the SD, the PSP, the DDS&T, the cognizant ALD and Department Chair, and a representative from the ALDF and DOE-BHSO. This review checks on the progress of the projects including its funding schedule. This allows the SD to ensure that the work be completed in a timely manner.

In addition, the SD conducts a monthly meeting with the DOE LDRD Project Manager to update the progress of the program and to solicit assistance to verify that the BNL LDRD Program is meeting the overall LDRD requirements. This includes providing the DOE-BHSO with copies of all funded proposals, an LDRD Program database, and a project funding and schedules summary report.

Project Reporting:
Routine documentation of each project funded under the LDRD Program consists of a file containing: (1) a copy of the written proposal; (2) all interim status reports; (3) notifications of changes in research direction, if any; (4) midyear review presentations and (5) reports on costs incurred. Also, a formal LDRD Plan, Program Assessment Report and the Annual Report on the LDRD Program are submitted to BNL management and the DOE summarizing work progress, accomplishments, and project status on all projects.

Documentation for the overall Program consists of (1) various program history files, (2) a running list of all proposals with their acceptance/rejection status, (3) funding schedule and summary reports for all approved projects, (4) permanent records on cost accounting, and a database containing information on each funded project (description, funding by fiscal year, status and accomplishments, follow-on funding, publications, etc.), (5) midyear review progress reports. A Data Collection Form (Exhibit C) is also utilized to formally collect information on the impacts of the projects. Each project will be tracked for two years after its completion so as to gather a complete set of data on the impact of the project. Also, we input LDRD data into the DOE-Chief Financial Officer's Laboratory/ Plant Directed Research and Development Web Site (https://ldrdrpt.doe.gov) to support DOE reporting of LDRD to Congress.

Some of the projects may involve animals or humans. Those projects will have received approval from the Laboratory's appropriate review committees. The projects which involve animals or humans are identified in this report as follows:

"Note: This project involves animal vertebrates or human subjects."

This is noted on the summary sheet and also at the end of each report.

All projects selected for approval are reviewed by the BNL Operations Security (OPSEC) Working Committee chair for classification review and operational security considerations.

Peer Review

LDRD projects have peer reviews performed in several different ways. Primarily, LDRD research is managed and reviewed by the cognizant Department and Division manager. These projects are a part of the activities of their respective Department and Divisions in which they reside. For the competed LDRD projects the members of the LDRD Section Committee are considered to have sufficient technical knowledge to perform peer reviews of projects during the initial selection process and annual renewal.

For the Strategic LDRD projects a formal peer review is performed on each project prior to final approval.

Also, all LDRD projects go through a formal mid-year review (described in the previous section under project supervision) conducted by the SD that includes the Assistant Laboratory Director for Policy and Strategic Planning, the Deputy Director for Science and Technology, the cognizant Department Chair and Associate Laboratory Director, and the DOE-BHSO LDRD Program Manager.

In addition to these peer reviews of the BNL LDRD projects subject to various advisory committees that consist of subject matter experts from academia and industry conduct peer reviews of LDRD projects as part of a Department's program review. One such group is the Brookhaven Science Associates' Science Advisory Committee, which performs peer reviews of different Laboratory programs on a rotating basis. There are also periodic reviews of the science at the Laboratory performed by various offices of DOE.

Financial Overview

Operating expenses for the LDRD program are funded through the Laboratory's overhead budget, which is derived from a uniform assessment against all programmatic and WFO activities performed at the Laboratory. In March of 2006, the DOE-CFO issued guidance that the LDRD Program will be "treated in a manner consistent with the method for distributing the general and administrative (G&A) expenses of a site." Therefore, BNL removed LDRD from the G&A pool and implemented a separate LDRD burden in order to obtain its funds.

At BNL, the LDRD Program was historically a much smaller portion of the total budget than at comparable National Laboratories. Accordingly, the LDRD budget has been significantly increased over the past ten years from $2.0 million to $11 million, or from less than 1% to almost 2.6 % of the Laboratory cost of $420 million which does not include construction cost of $52.5 million. The target level is to increase the level to about 4%, which would still be less than the DOE maximum ceiling of 8%. This better enables the Laboratory for preparing itself for work in emerging areas of research.

In FY 2006, the BNL LDRD Program funded 85 projects, 28 of which were new starts, at a total cost of $11,101,892. See Appendix A for a complete list of FY 2006 active projects. The majority of the planned LDRD budget is allocated at the beginning of the fiscal year. Approximately 20% of the funds were allocated to the Strategic LDRD pool (8 projects) and the remaining 80% was awarded to competed LDRD projects (77 projects). A summary of the history of LDRD projects is show below.

A brief description of the FY 2007 new startups and the budgets is given in Exhibit H.

FY	DOE AUTH. $K	BNL AUTH. $K	COSTED $K	NO. RECD.	NEW STARTS	TOTAL FUNDED
1985	4,000	1,842	1,819	39	13	13
1986	4,500	2,552	2,515	22	15	25
1987	4,000	1,451	1,443	29	8	17
1988	4,000	1,545	1,510	46	14	23
1989	4,000	2,676	2,666	42	21	29
1990	4,000	2,008	1,941	47	9	26
1991	2,000	1,353	1,321	23	14	21
1992	2,500	1,892	1,865	30	14	25
1993	2,500	2,073	2,006	35	14	28
1994	2,500	2,334	2,323	44	15	27
1995	2,500	2,486	2,478	46	13	31
1996	3,500	3,500	3,050	47	17	31
1997	4,500	4,500	3,459	71	10	28
1998	3,500	4,000	2,564	53	4	20
1999	4,750	4,612	4,526	67	25	33
2000	6,000	6,000	5,534	93	21	45
2001	6,000	6,000	5,345	97	38	70
2002	7,000	7,000	6,732	87	29	70
2003	8,500	8,482	7,830	153	44	83
2004	9,500	8,550	7,209	107	19	72
2005	10,500	9,073	8,379	114	41	78
2006	11,500	9,127	11,102	96	28	85
2007	15,500	13,600		99	34	73
TOTALS			87,617	1,487	460	953

Relatedness of LDRD to Laboratory Programs and Initiatives

BNL's mission is to produce excellent science in a safe, environmentally benign manner with the cooperation, support, and appropriate involvement of our many communities. The Laboratories core competence lies in five areas:

Design, Construct, and operate extraordinary facilities
Advance concepts of accelerators, detectors, magnets and instrumentation
Synchrotron radiation sciences and technologies
Imaging expertise
Scientific computing

Research initiatives are a primary tool by which the Laboratory builds core competences and capabilities in particularly promising areas of science and technology and to meet anticipated national needs. The LDRD plays an important role in realizes successful outcomes for its initiative by providing resources in key areas of initiative development. Each year Laboratory management carefully reviews both existing research initiatives and proposed new areas for progress, scientific and technological promise, match to BNL's strengths and mission roles, and relevance to DOE missions and evolving national needs. As part of the review process, management identifies the needs for each initiative. These areas are subsequently included in the annual LDRD call for proposals and given high priority for funding. Development of capabilities in these areas is essential to realizing successful outcomes for our initiatives.

Building on its suite of core competencies, the major initiatives, which the Laboratory will undertake to achieve these goals for FY 2007, are:

NSLS II
Evolution of RHIC to a QCD Lab
Nanoscience
Translational Biomedical Imaging
Energy
Computational Science

NSLS-II - A state of the art ultra-bright medium energy storage ring delivering world leading performance. Its unique characteristics (spatial resolution of 1 nm and energy resolution of 0.1 meV) will open up new regimes of scientific discovery and investigation, and enable exploration of the correlation between nanoscale structure and function, the mechanisms of molecular self-assembly, and the science of emergent behavior, especially for correlated electron systems.

Evolution of RHIC to a QCD Lab – The discoveries at RHIC have led to compelling questions about QCD and vice versa. Compelling questions have in turn prompted the need for evolution of the facility to further the study of QCD (quantum chromodynamics) experimentally and theoretically. The expectation is that the combination of RHIC, eRHIC, and QCDOC as a "QCD

Lab" will play a major role in determining the nature of the quark-gluon plasma and the visible universe, the origin of the spin of the proton, and the role of the color glass condensate in the structure and interaction of high energy hadrons.

Nanoscience – Through the development of materials exhibiting novel and unprecedented functionality for energy manipulation and utilization, nanoscience offers a new approach to address the energy security challenges facing the U.S. BNL will focus on energy security in the areas of nanostructured catalysts, electronic nanomaterials, and bio/soft nanomaterials and interfaces in order to develop the scientific foundation and tools for the design and creation of functional nanomaterials.

Translational Biomedical Imaging – The combination of expertise in radiotracer chemistry, imaging physics, and preclinical and clinical neuroscience will enable determination of how the brain develops, changes, and adapts to the environment over a lifetime; how drug addiction, obesity, and other disorders affect the brain; how genetic variations affect brain structure, biochemistry, and behavior; how drugs taken during pregnancy affect the brain of the fetus and adult offspring - with the ultimate goal of translating findings to clinical use.

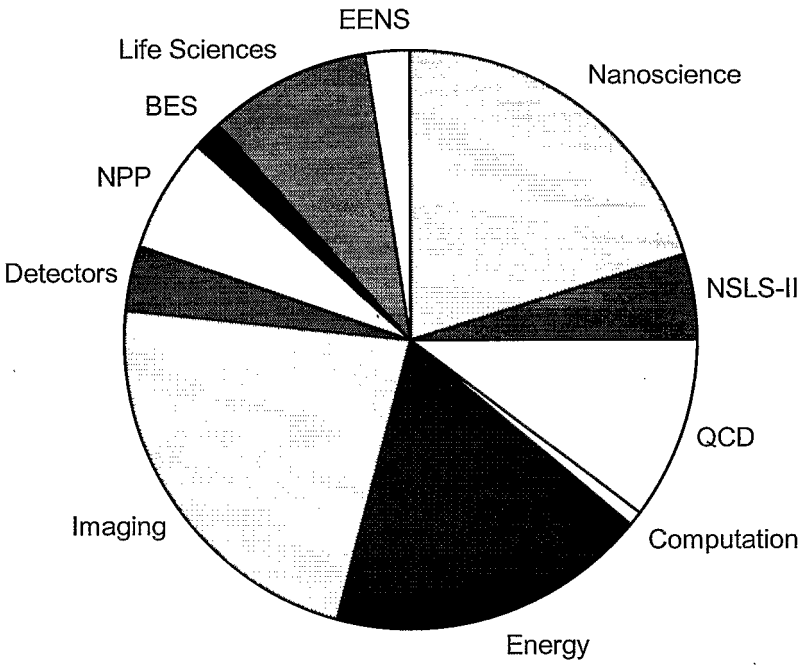
Energy – BNL will lead in the development of advanced materials and processes for energy applications, especially in the areas of catalysis, high performance materials, solar energy, and biologically-derived fuels.

Computational Science – BNL will become the leading center for computational biology, nanoscience, and QCD as it builds up an interdisciplinary team of first-rate scientists and software experts that will use and operate a leadership class machine as a national user facility.

General – Forefront areas of basic and applied science and technology for the primary purpose of enriching Laboratory capabilities. Some of the areas categorized under the heading of General are, Life Sciences, Nuclear Particle Physics (NPP), Detectors, Energy, Environment & National Security (EENS), and Basic Energy Science(BES).

The LDRD program included these initiatives in its call for proposal for FY 2007. See Exhibit A. A listing of the FY 2007 project by initiatives is included as Exhibit I. Below is a chart reflecting the distribution of projects by laboratory initiatives. These initiatives are aligned with the DOE office on science initiatives.

Targeted FY07 LDRD and Program Development Allocation



Self Assessment

BNL supports the concept of continued improvement as part of its management of the Laboratory. To achieve this goal every year BNL performs self-assessments on various functions at the Laboratory. Specifically, every year, BNL conducts self-assessment on LDRD Program to support the concept of continual improvement.

In FY 2006, all aspects of the program were reviewed. The following actions and activities contributed to the Laboratory's self-assessment of the LDRD program in FY 2006.

- CFO Guidance on G&A application on LDRD issued in March 2006
- New Order 413.2B issued in April 2006
- LDRD Program review at BNL conducted in May 2006
- New Roles and Responsibilities issued in June 2006
- The SNL LDRD program review in August 2006
- BNL's FY 2007 selection process review in August 2006
- The INL LDRD program review in September 2006

CFO Guidance On G&A Application

In March of 2006, the DOE CFO issued implementation guidance, Exhibit J, to the Laboratory on how LDRD was to comply with the Congressional direction included in the Energy and Water Appropriation Act 2006. Guidance required the Laboratory to review its current methodology of collecting funds for the LDRD program as part of the G&A pool. After review of the policy, BNL changed its practice and developed a separate LDRD pool. All LDRD projects now have G&A applied to their project costs.

This change was to include Laboratory cost accounting practices and was reported to DOE in the BNL Disclosure Stated dated September 8, 2006. The changes resulted in an increasing total cost of the LDRD program. This in turn required an approval from DOE to increase the ceiling of the BNL program from $11.5 million to $13.5 million. BNL received DOE approval on March 17, 2005, see Exhibit K.

This new process for accumulation of LDRD funds was reviewed at the end of the FY 2006 with the BNL Budget Office. The review noted that the LDRD rate originally established in FY2006 may require adjusting during FY2007 based on the final resolution of the FY 2007 Energy and Water Appropriation bill.

New Order 413.2B

DOE issued an updated version of Order 413.2B on LDRD on April 19, 2006. BNL did a full review of the new order to determine any impacts resulting from the order. The current BNL processes were compliant with the new order and no changes were necessary as a result of the Order. The only change required was the updating of the reference to the Order in the BNL Standard Based Management Subject Area on LDRD.

LDRD Program Review In May Of 2006

BNL hosted the annual LDRD program review conducted by J. LaBarge of the Office of Science. The review was conducted on May 24 and 25, 2006 in two phases and was attended by representatives from across the DOE complex. Day one was a review of the BNL program including management, administration, and a sampling of LDRD projects. The second day focused on the other four DOE SC Laboratory LDRD programs and system-wide topics. At the conclusion of the review, DOE conducted an out-briefing, which included the following recommendations and comments, which were implemented.

Comments on the Program Review meeting

- The program presentation on 5/24/06 was very good.
- The afternoon presentations needed to be less technical and they needed to have a clearer separation of the LDRD portion of the project from DOE follow-on funding portion.

Comments on BNL's FY 2005 Annual Report for next year's report

- Carefully review follow-on funding claim
- Carefully review the DOE Program Funding vs. LDRD Funding
- Include a longer Self-Assessment Report, see ORNL, ANL
- More editing of the individual project reports to make clear the separation between the LDRD work and the direct funded work.

Comments of the BNL LDRD Process

- Need to add one or two scientific reviews to the DSR process
- Be sure to document the mid-year review process.

Actions from the meeting and out briefing

- Send CD of presentation to all attendees
- Send meeting binder to R. Dalton, DOE-CH
- Send copy of old requirement memos and letters to LaBarge
- Send copy of letter ending WFO calculation on LDRD projects to J. LaBarge
- Review Dick Hahn project to confirmed that BNL is not funding LDRD and DOE at the same time
- Review DSR process with P. Looney
- Conduct dry run for future LDRD presentation to DOE.

All of the recommendations and comments were acted upon. Specifically:

Annual Report

The FY 2006 report is being drafted using the recommendations from the Program review on reviewing the individual project reports. The Program review/ Self Assessment, this document, is now in a format similar to ORNL.

LDRD Process

The process from selection and peer review of DSR projects was strengthened and the changes were

incorporated into the LDRD SBMS Subject area see Exhibit F.

Action Items
All of the actions were completed and as noted above. P. Looney reviewed the LDRD DSR process with the Laboratory Director and Deputy Director for Sciences and strengthened the peer review process.

New Roles and Responsibilities

DOE issued an updated version of Roles and Responsibilities for LDRD to DOE Laboratories on June 19, 2006, see Exhibit L. BNL did a full review of the Roles and Responsibilities to determine any impacts resulting from the guidance. This guidance was a compilation of various other documents that were issued over several years. The current BNL processes were compliant with the new guidance and no changes were necessary. The only change required was the updating of the reference to the guidance in the BNL Standard Based Management Subject Area on LDRD.

SNL LDRD Program In August 2006

The Scientific Director from the BNL LDRD program attended the FY2006 Annual program Review held at Sandia National laboratories (SNL) in Albuquerque, New Mexico on August 15-16, 2006. The review included an overview of the LDRD programs at SNL, Los Alamos Laboratory, Lawrence Livermore National l Laboratory, and the Nevada Test Site. Principal investigators from each of the laboratories gave technical presentations about their LDRD research as it pertains to important national security topical science and technology (S&T) areas. The review concluded with a panel discussion among the DOE and WFO sponsors on how the LDRD Program impacts their agencies. This was a good opportunity to learn more about the LDRD Program and how it is supporting the mission needs of NNSA, DOE, and other Federal Agencies. Additionally, on the morning of August 17, tours of the new Center for Integrated Nanoscience and Technology (CINT) and Microsystems and Engineering Sciences and Applications (MESA) Facilities was offered. The Review was conducted at an unclassified level.

INL LDRD Program Review In September 2006

A representative from the BNL LDRD program attended the Idaho National Laboratory (INL) annual LDRD program review in September 2006. The INL process for establishing budget and selection of projects is different than BNL's. Some elements of the INL process will be taken under consideration as the BNL program evolves. Of particular interest is the practice of establishing leaders to champion a strategic initiatives and having the leader coordinate the call for proposal, screening and recommendation of projects for that initiative.

BNL Selection Process Review

As part of the annual assessment of the LDRD Program the PSP met with each ALD to solicit feedback on the LDRD selection process. In general, the comments were positive and the current process will continue in FY 2007 with some logistic changes. The Program Director and the PSP also solicited feedback from Brookhaven Council. The Brookhaven Council is an elected body that advises the Director on matters affecting the scientific staff. The Council is particularly concerned with maintaining an atmosphere conducive to excellence in scientific research at the Laboratory. The Council recommends the scientific member assigned to the LDRD Selection committee.

The Council reviewed the FY 2007 LDRD Proposal Section Process and provided the recommendations for improvements. The review and recommendation included as Exhibit M and are under consideration.

The LDRD Program continues to emphasize that funding would be made for two years (twenty four months). This permits BNL to fund more projects in subsequent years. However, due to the Continuing Resolution and uncertainty in final annual budgets, new project start dates have been delayed. This is resulting in projects being 24 months in length, spanning three fiscal years. There was a mid-year review of all projects. This review was a factor in determining whether a project would continue into the next fiscal year. The mid-year review continues to improve in format and quality. Several Directorates now conduct preliminary reviews of the projects prior to the Laboratory formal mid-year review. In addition, the Scientific Director conducted monthly meetings with the DOE Brookhaven Site Office (BHSO) to update the progress of the program and verify that the BNL LDRD Program is meeting the overall LDRD requirements.

In conclusion, BNL maintains its support of any new DOE LDRD requirements by:

- Implementation of DOE Order 413.2A through the LDRD Standard Based Management System Subject Area
- Participating in the DOE SC LDRD working group to develop new guidelines
- Participating in changes to the DOE Chief Financial Officer (CFO) LDRD database
- Ensuring that all projects support the DOE security missions and missions of other federal agencies
- Identifying potential use/benefits to the DOE security missions for all projects
- Submitting data sheets for all projects to the DOE-BHSO for concurrence
- Including the DOE-BHSO LDRD Program Manager in all LDRD selection meetings
- Conduct an annual Program - Self Assessment.

Summary of Success Indicators

Statistical data is collected on all projects for the annual report. Since the LDRD Program is intended to promote high-risk research, the data collected has nominal value on a project-by-project basis. It does provide a general overall picture of the productivity of the LDRD Program.

Some of the more common indicators/measures of success are: 1) the number of proposed, received and approved projects, 2) amount of follow-on funding, 3) the number of patents applied for, and 4) the number of articles published in peer-reviewed journals.

Historically, statistics on the number of projects approved, compared to those rejected, show an overall approval rate of about 30 percent for new starts. Essentially all of the scientific departments were represented in the FY 2006 LDRD Program. The LDRD Program at BNL is expanding and is generating interest from across the entire Laboratory population.

An analysis of the FY 2006 projects shows that many of the projects were reported to have submitted proposals for grants or follow-on funding (several received funding), and a multitude of articles or reports were reported to be in publication or submitted for publication. Several of these projects have already experienced varying degrees of success, as indicated in the individual Project Program Summaries that follow. A summary of success indicators for the FY 2006 projects is as follows:

SUCCESS INDICATORS FY 2006	QTY
Number of postdoctoral researchers supported in full or in part by LDRD during the fiscal year.	46
Number of students supported in full or in part by LDRD during the fiscal year.	61
Number of full-time scientific and technical research staff hired as a result of full or partial LDRD support during the fiscal year.	18
Number of LDRD-derived refereed publications (e.g., journal articles, conference papers, book chapters, or other reports) published during the fiscal year. This indicator includes all publications derived in whole or in part from LDRD projects funded in any year.	116
Number of LDRD-derived invention disclosures filed during the fiscal year (disclosure are internal laboratory intellectual property documents). This indicator includes all disclosures derived in whole or part from LDRD projects funded in any year and all subsequent LDRD follow-on activities.	8
Number of LDRD-derived patents issued/granted during the fiscal year. This indicator includes all patents derived in whole or part from LDRD projects funded in any year and all subsequent LDRD follow-on activities.	0
Number of LDRD-derived copyrights (other than publications) issued/granted during the fiscal year. This indicator includes all copyrights derived in whole or part from LDRD projects funded in any year and all subsequent LDRD follow-on activities.	0

SUCCESS INDICATORS FY 2006	QTY
Total number of national awards or recognitions received that are attributable in whole or in part from the 2006 LDRD projects.	6
Total number of formal presentations originating in whole or in part from this LDRD, including those that have been accepted for presentation but not yet presented.	215
Total number of reports originating in whole or in part from this LDRD.	21
Total number of review presentations that pertain to this work.	11

In conclusion, the overall LDRD Program has been successful. In FY 2006, the LDRD Program has improved on the level established in FY 2005 which already was at a high level. This increase in size is a consequence of the identification of the LDRD Program by Laboratory Management to be an important part of its future. The LDRD Program is a key component for developing new areas of science for the Laboratory. In FY 2006 the Laboratory continued to experience a significant scientific gain by the achievements of the LDRD Projects.

Funding Table of LDRD Projects Approved FY 2006

Appendix A

LDRD Proj. No.	Project Title	P.I.	Dept/Bldg	Actual FY04 $	Actual FY05 $	Actual FY06 $	FY07	FY08	Total
03-104	Hydrogen Atom Transfer from Carbon to Metal - Relevance of a Novel Reaction to Catalyzed Hydrocarbon Conversions	Bullock, M.	CHEM/555A	56,480	58,039	32,516			167,035
04-011	Femtosecond Photoinitiated Nanoparticle Surface Chemistry	Camillone, N.	CHEM/555	79,532	121,071	54,737			255,340
04-013	Chirped Pulse Amplification at the DUV-FEL	Yu, L.H.	NSLS/725C	78,404	119,331	54,633			252,368
04-025	Overcoming Coherent Instabilities at Medium-Energy Storage Rings	Boris Podobedov for Wang, J.-M.	NSLS/725C	91,415	128,858	53,795			274,068
04-033	Layered Cobaltates with High Thermoelectric Power	Li, Qiang	MSD/480	61,780	103,160	25,616			190,556
04-038	Complex Thin Films and Nanomaterial Properties	Misewich, J.	MSD/480	79	190,532	370,772	195,000		756,383
04-041	Lattice QCD Relevant for PHIC and AGS	Petreczky, P.	PHYS/510A	69,272	109,751	48,156			227,179
04-043	Very Long Baseline Neutrino Oscillation Experiment	Diwan, M.	PHYS/510E	71,099	106,166	46,012			223,277
04-046	Advanced 3He Detectors for the Spallation Neutron Source	Smith, G.	INST/535B	72,953	109,650	50,173			232,776
04-055	Genetic NanoTags	Hainfeld, J.	BIO/463	12,933	114,424	135,077			262,434
04-060	The Use of Singular Point Genome Sequence Tags to Analyze Community Composition and Metabolic Potential	van der Lelie, D.	BIO/463	121,236	185,509	77,544			384,289
04-061	3-D Electronic Wave Functions from EM Images	Wall, J.	CFN/463	98,945	149,814	67,144			315,903
04-062	Functional MRI Studies in Rats using Implanted Brain Electrodes	Gifford, A.	MED/490	78,466	119,912	56,135			254,513
04-063	Optimizing Functional Neuroimaging Techniques to Study Brain Function in Health and Disease States	Goldstein, R.	MED/490	100,684	144,278	69,277			314,239
04-066	Technological Development of a Fluorescence Probe for Optical Detection of Brain Functional Activation *in vivo*	Du, C.	MED/490	27,032	132,570	121,180			280,782

Funding Table of LDRD Projects Approved FY 2006

Appendix A

LDRD Proj. No.	Project Title	P.I.	Dept/Bldg	Actual FY04 $	Actual FY05 $	Actual FY06 $	FY07	FY08	Total
04-069	Nuclear Control Room Unfiltered Air In-Leakage by Atmospheric Tracer Depletion (ATD)	Dietz, R.	ESD/815E	59,463	88,764	41,167			189,394
04-073	Perfluorocarbon Tracer Sampling, Tagging and Monitoring Techniques for use at the Urban Atmospheric Observatory	Heiser, J.	ESD/830	65,530	98,809	45,056			209,395
04-079	Development of an Aerosol Mobility Size Spectrometer and an Aerosol Hygroscopicity Spectrometer	Wang, J.	ESD/815E	65,589	99,415	53,471			218,475
04-086	Exploration of Thermal Diffusion Processes in CdZnTe for Improved Nuclear Radiation Detectors	Bolotnikov, A.	NNS/197C	86,077	131,041	60,502			277,620
04-088	An Integrated Approach of High Power Target concept Validation for Accelerator-Driven Systems	Simos, N.	ES&T/475B	82,747	121,361	53,954			258,062
04-104	Hydrogen Storage Using Complex Metal Hydrides for Fuel Cell Vehicles	Wegrzyn, J.	ES&T/815	70,265	108,592	36,891			215,748
05-003	Full Power Test of the Amplifier for the Optical Stochastic Cooling using JLAB FEL	Yakimenko, V.	PHYS/820M		112,488	160,571			273,059
05-005	Study of Photon Coupling to an Electromagnetic Field Gradient	Scarlett, C.	PHYS/510E		105,693	175,406			281,099
05-006	Heavy Ion Physics with the ATLAS Detector	Takai, H.	PHYS/510A		5,623	124,143	104,000		233,766
05-017	Superconducting Lead Photoinjector	Smedley, J.	INST/535B		117,500	156,480			273,980
05-020	Controlled Formation of Nanostructured RuO2 Catalysts	Sutter, P.	CFN/555		117,502	148,357			265,859
05-021	Hydrogen Storage in Complex Metal Hydrides	Sutter, P. for Vogt T.	CFN/510A		123,301	167,271			290,572
05-028	Behavior of Water on Chemically Modified Semiconductor Surfaces: Toward Photochemical Hydrogen Production	Fujita, E.	CHEM/555A		89,092	159,760	40,000		288,852
05-030	Assembling of Biological and Hybrid Complexes on Surfaces	Gang, O./Freimuth, P.	CFN/510B/463		139,859	188,818			328,677

Funding Table of LDRD Projects Approved FY 2006

Appendix A

LDRD Proj. No.	Project Title	P.I.	Dept/Bldg	Actual FY04 $	Actual FY05 $	Actual FY06 $	FY07	FY08	Total
05-033	Ultra High Resolution Photoelectron Spectrometer	Johnson, P.	CMP/510B		67,053	81,592			148,645
05-038	Metal-Metal Oxide Electrocatalysts for Oxygen Reduction	Vukmirovic, M.	MSD/555		99,510	137,025			236,535
05-041	Multifunctional Nanomaterials for Biology	Wong, S.	MSD/480		128,192	145,480	25,000		298,672
05-042	Polariton-Enhanced FRET for Device-Integration of Plasma Membranes from Rhodobacter Sphaeroides	Kao, C.-C.	NSLS/725D		79,321	103,218			182,539
05-044	Intense THz Source & Application to Magnetization Dynamics	Carr, G. L.	NSLS/725D		50,175	131,904	66,000		248,079
05-048	Nano-Imaging of Whole Cells with Hard X-Ray Microscopy	Miller, L.	NSLS/725D		19,496	91,159	71,000		181,655
05-050	Study to Convert NSLS VUV Ring to Coherent IR Source	Podobedov, B.	NSLS/725C		49,261	16,600			65,861
05-051	Superconducting Undulator Technology	Rakowsky, G.	NSLS/725D		189,451	228,264			417,715
05-057	Characterization and Imaging of Amyloid Plaques Using Diffraction Enhanced Imaging	Zhong, Z.	NSLS/725D		100,793	131,955			232,748
05-058	Development of Methodologies for Analyzing Transcription Factor Binding in Whole Genomes	Anderson, C.	BIO/463		92,970	143,704	71,000		307,674
05-063	Application of Endophytic Bacteria to Improve the Phytoremediation of TCE and BTEX using Hybrid Poplar	van der Lelie, D.	BIO/463		212,900	281,627			494,527
05-064	Design and Build Two Dimensional Proten-Lipid Thin Film: A First Step Toward Novel Biochips	Wei, Y.	BIO/463		61,342	76,898			138,240
05-068	Positron Labeled Stem Cells for Non-Invasive PET Imaging Studies of In-Vivo Trafficking and Biodistribution	Srivastava, S.	MED/801		63,600	140,374	153,000		356,974
05-069	Breaking the Millimeter Resolution Barrier in fMRI	Tomasi, D.	MED/490		109,920	146,891			256,811
05-070	Novel Multi-Modality MRI and Transcranial Magnetic Stimulation to Study Brain Connectivity	de Castro Caparelli, E.	MED/490		105,571	145,397	17,000		267,968

Funding Table of LDRD Projects Approved FY 2006

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LDRD Proj. No.	Project Title	P.I.	Dept/Bldg	Actual FY04 $	Actual FY05 $	Actual FY06 $	FY07	FY08	Total
05-071	Ovarian Hormone Modulation of ICP: MRI Studies	Biegon, A.	MED/490		107,120	144,973			252,093
05-072	Feasibility of CZT for Next-Generation PET Performance	Vaska, P.	MED/490		111,425	135,784	136,000		383,209
05-074	Biology on Massively Parallel Computers	Davenport, J. W.	CSC/463B		168,787	222,345	40,000		431,132
05-078	Ionic Liquids in Biocatalysis and Environmental Persistence	Francis, A. J.	ESD/490		99,464	120,049			219,513
05-082	Single Particle Laser Ablation Time-of-Flight Mass Spectrometer (SPLAT-MS) Enhancements: Aerosol Optical Properties and Increased Particle Detectivity	Senum, G.	ESD/815E		97,705	132,696			230,401
05-088	Transition Metals in Oil and Gas Exploration	Vairavamurthy, A.	ES&T/815		128,489	163,631			292,120
05-092	An Innovative Infiltrated Kernel Nuclear Fuel (IKNF) for High-Efficiency Hydrogen Production with Nuclear Power Plants	Saccheri, J./Bowerman, B	ES&T/475B		130,393	172,648			303,041
05-094	Development of Green Processes: Catalytic Hydrogenation in Water Utilizing In Situ Biologically-Produced Hydrogen	Mahajan, D./van der Lelie	ES&T/815 - BIO/463		274,561	358,800			633,361
05-098	Fast Neutron Imaging Detector	Lemley, J.	NNS/197C		124,052	190,989			315,041
05-104	Giant Proximity Effect (GPE) in High-Temperature Superconductors	Bozovic, I.	MSD/480		267,837	366,753	255,000		889,590
05-105	Development of an Observation Based Photochemical-Aerosol Modeling System	Wright, D.	ESD/815E		109,033	106,242			215,275
05-110	Computational Science	Davenport, J.	CSC/463B		109,776	87,284			197,060
05-114	Study of High-Tc Nanostructures	Bozovic, I.	MSD/480		265,787	367,090	255,000		887,877
06-001	Lattice Studies of QCD Thermodynamics on the QCDOC	Karsch, F.	PHYS/510A			158,792	161,000		319,792
06-004	Detector Development for Very Long Baseline Neutrino Exp.	Diwan, M.	PHYS/510E			66,230	126,000	76,000	268,230
06-012	Detector for High Quality Images of Electron Microscopy	Rehak, P.	INST/535B			70,180	141,000	71,000	282,180

Funding Table of LDRD Projects Approved FY 2006

Appendix A

LDRD Proj. No.	Project Title	P.I.	Dept/Bldg	Actual FY04 $	Actual FY05 $	Actual FY06 $	FY07	FY08	Total
06-017	Transmission Photocathode Development	Smedley, J.	INST/535B			67,470	135,000	67,000	269,470
06-021	Synthesis and Characterization of Band-Gap-Narrowed TiO2 Thin Films and Nanoparticles for Solar Energy Conversion	Sutter, E.	CFN/480			69,484	207,000	138,000	414,484
06-026	Multiscale Analysis of In Vivo Nanoparticle Exposure	Schiffer. W. K.	CHEM/555			192,178	192,000		384,178
06-030	Development of Gadolinium-Loaded Liquid-Scintillators with Long-Term Chemical Stability for a New High-Precision Measurement of the Neutrino Mixing Angle, Theta-13	Hahn, R. L.	CHEM/555A			199,946	191,000		390,946
06-037	Electronic Properties of Carbon Nanotubes and Novel Multicomponent Nanomaterials	Hill, J. P.	CMP/510B			45,590	180,000	90,000	315,590
06-038	Growth and Characterization of CdZnTe Crystals for Improved Nuclear Radiation Detectors	Gu, G./Bolotnikov, A.E.	CMPMSD/510 A - NNS/197C			62,932	185,000	131,000	378,932
06-039	Design, Synthesis and Characterization of a New Class of Hydrocarbon Polymers Containing Zwitter Ions and Nanostructured Composites for High Temperature Membrane in PEM Fuel Cells	Yang, X. -Q.	MSD/555			133,331	131,000		264,331
06-044	New High-Resolution X-Ray Monochromators for Condensed-Matter Science Experiments	Caliebe, W. A.	NSLS			1,871			1,871
06-046	Novel Materials for Hard X-Ray Optics	Evans-Lutterodt, K.	NSLS/725D			24,809	147,000		171,809
06-047	Nano-Crystallography of Individual Nanotubes and Nanoparticles	Nelson, C.	NSLS/725D			62,673	132,000	66,000	260,673
06-052	High-Temperature Superconducting Magnet Development	Tanabe, T.	NSLS/725C			236,846	214,000		450,846
06-056	Epigenetics: Mathamphetamine (MAP)-Induced Brain Dysfunction and Methylation of DNA	Dunn, J.	BIO/463			76,620	181,000	87,000	344,620

Funding Table of LDRD Projects Approved FY 2006

Appendix A

LDRD Proj. No.	Project Title	P.I.	Dept/Bldg	Actual FY04 $	Actual FY05 $	Actual FY06 $	FY07	FY08	Total
06-060	Molecular Mechanism of Chromosomal Replication Initiation in Eukaryotic System	Li, H.	BIO/463			101,859	208,000	106,000	415,859
06-061	Diversification of Isoflavonoid Biosynthesis	Liu, C. -J.	BIO/463			437,328	481,000		918,328
06-065	Metabolic Flux Analysis in Arabidopsis Thaliana	Schwender, J.	BIO/463			425,511	481,000		906,511
06-066	Transformation and Fate of Nanomaterials in the Environment	Fitts, J.	ESD/830			140,086	148,000		288,086
06-071	Development of a Cloud Condensation Nucleus Separator	Wang, J.	ESD/815E			69,661	140,000	70,000	279,661
06-074	Aluminum Hydride - An Ideal Hydrogen Source for Small Fuel Cells	Graetz, J.	ES&T/815			132,601	134,000		266,601
06-087	Gamma Ray Imager for National Security Applications	Vanier, P. E.	NNS/197C			110,380	134,000		244,380
06-088	Neurogenomics: Collaboration Between the Biology Department and the Brookhaven Center for Translational Neuroimaging to Investigate Complex Disease States	Alia-Klein, N./Fowler, J.S.	MED/490			149,971	157,000		306,971
06-092	Nanoparticle Labeled Neural Stem Cell Tracking In Vivo by Magnetic Resonsance Microscopy	Benveniste, H.	MED/490			109,022	117,000		226,022
06-094	MicroCT Methods of Quantitative Adipose Imaging: Development of a Long-Term Assessment Technique for Studying Obesity in a Rodent Model	Wang, G. J.	MED/490			77,143	197,000	82,000	356,143
06-095	Study of Overdoped HTS Materials	Bozovic, I.	MSD/480			181,219			181,219
06-096	HTS Trilayer Josephson Junctions	Bozovic, I.	MSD/480			212,075			212,075
06-097	Photocatalytic Reduction of CO_2 in Supercritical CO_2	Grills, D.	CO/555			80,098	155,000	71,000	306,098
						11,101,892			

Office of Policy and Strategic Planning
Laboratory Directed Research and Development Program

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date: *March 8, 2006*

to: *Scientific Staff*

from: *L. Newman L.N.*

subject: *Laboratory Directed Research & Development Program (LDRD) Proposals*

We are now soliciting proposals for the annual LDRD competition. Please note that we now request that you submit the one page Summary of Proposal to your respective ALD for assessment and comment prior to writing the full proposal. Full proposals must be submitted electronically by email through your respective Chairperson and Associate Laboratory Director to D.J. Greco (greco@bnl.gov) by April 17, 2006.

A revised version of the Proposal Information Questionnaire (PIQ) submission form must be used, and it can be obtained electronically by going to https://sbms.bnl.gov/sbmsearch/subjarea/99/3c02e011.doc. A copy is attached for your convenience. The BNL LDRD Policy, which defines the LDRD Program, can be reviewed at this web site. In my capacity as Scientific Director for LDRD, I am available to counsel individuals to aid them in their preparation of a successful proposal. Please note that LDRD projects are restricted to a maximum of three years. However, projects and their budgets should be tailored to no more than a two-year schedule. Along with your proposal you are requested to include a one-page vita. We are no longer requiring a milestone chart but the budgets now need to include the Laboratory G&A. In each year there is a mid-year review of all programs to assess the extent of progress.

Research conducted under the LDRD Program should be highly innovative, and an element of high risk as to success is acceptable. This year we will be pleased to receive innovative new projects in support of the following Laboratory Strategic Focus Areas:

- **NSLS II**
- **Evolution of RHIC to a QCD Lab**
- **Nanoscience**
- **Translational and Biomedical Imaging**
- **Energy**
- **Computational Science**
- **General**

An elaboration of these initiatives can be found at the LDRD web site, www.bnl.gov/ldrd. We will be especially looking for proposals that involve multidisciplinary talents and that cross departmental lines. These proposals can be budgeted at somewhat higher levels. The total amount of money for new starts in FY 2007 has not yet been determined, but could be as high as 6.5 million (with G&A).

The Selection Committee will be chaired by the Scientific Director for LDRD and includes the Assistant Laboratory Director for Policy and Strategic Planning, the Deputy Director for Science and Technology, the Associate Laboratory Directors, and is augmented by selected distinguished scientists. The committee hopes to conclude the selection process by the end of July.

LN:kjf
Attachment

cc: Level I and II Managers
N. Narain

K:\LDRD\FY 2007\Call memo Scientific FY 2007.doc

BROOKHAVEN NATIONAL LABORATORY
PROPOSAL INFORMATION QUESTIONNAIRE
LABORATORY DIRECTED RESEARCH AND DEVELOPMENT PROGRAM

PRINCIPAL INVESTIGATOR _____ **PHONE** _____

DEPARTMENT/DIVISION _____ **DATE** _____

OTHER INVESTIGATORS _____

TITLE OF PROPOSAL _____

PROPOSAL TERM (month/year) From _____ Through _____

SUMMARY OF PROPOSAL

Description of Project:

Expected Results:

INSTRUCTIONS

Under **Description of Project**, provide a summary of the scientific concept of the proposed project including the motivation for the undertaking and the approach that will be used to conduct the investigation. Also indicate how the project meets the general characteristics of the LDRD Program and how it is tied to the DOE Mission.

Under **Expected Results**, clearly enunciate what are the expected results and how they will impact the science.

These items should not exceed the space remaining on this page, using the given font and size. The content should be understandable by the non-expert. Do not use jargon (defined by Webster as the "technical or secret vocabulary of a science"), as this has no meaning or utility to the non-expert. Submit this Summary of Proposal for review by your ALD. Upon concurrence and possible modification of your summary, follow it with an extended Proposal of no more than three (3) pages in length. In addition, include a one-page Vita of the Principal Investigator; fill out the page with citations to recent pertinent publications. Do not include any additional attachments, as these will be discarded. Complete the Questionnaire, obtain the required approvals, and provide a budget in the format on the form supplied. Break down the funding by fiscal year and by the broad categories of labor, materials and supplies, travel (foreign & domestic), services and subcontracts. LDRD funds cannot be used to purchase capital equipment. Indicate the intent to use collaborators, postdoctoral research associates, and/or students. Identify the various burdens applied, i.e., organizational, materials, contracts, and any other charges. Include the Laboratory G&A in the budget statement. Go to the LDRD web site (www.bnl.gov/ldrd/) for further information. **The Instructions should be removed before proceeding.**

PROPOSAL

VITA (Principal Investigator)

1. HUMAN SUBJECTS (Reference: DOE Order 1300.3)

Are human subjects involved from BNL or a collaborating institution?

If **yes**, attach copy of the current Institutional Review Board Approval and Informed Consent Form from BNL and/or collaborating institution. Y/N _____

2. VERTEBRATE ANIMALS

Are vertebrate animals involved?

Y/N _____

If **yes**, has approval from BNL's Animal Care and Use Committee been obtained? Y/N _____

3. NEPA REVIEW

Are the activities proposed similar to those now carried out in the Department/Division which have been previously reviewed for potential environmental impacts and compliance with federal, state, local rules and regulations, and BNL's Environment, Safety, and Health Standards? (Therefore, if funded, proposed activities would require no additional environmental evaluation.) Y/N _____

If **no**, has a NEPA review been completed in accordance with the Subject Area National Environmental Policy Act (NEPA) and Cultural Resources Evaluation and the results documented? Y/N _____

(Note: If a NEPA review has not been completed, submit a copy of the work proposal to the BNL NEPA Coordinator for review. No work may commence until the review is completed and documented.)

4. ES&H CONSIDERATIONS

Does the proposal provide sufficient funding for appropriate decommissioning of the research space when the experiment is complete? Y/N _____

Is there an available waste disposal path for project wastes throughout the course of the experiment? Y/N _____

Is funding available to properly dispose of project wastes throughout the course of the experiment? Y/N _____

Are biohazards involved in the proposed work? If yes, attach a current copy of approval from the Institutional Biosafety Committee. Y/N _____

Can the proposed work be carried out within the existing safety envelope of the facility (Facility Use Agreement, Nuclear Facility Authorization Agreement, Accelerator Safety Envelope, etc.) in which it will be performed? Y/N _____

If **no**, attach a statement indicating what has to be done and how modifications will be funded to prepare the facility to accept the work.

5. TYPE OF WORK Select Basic, Applied or Development _____

6. LINK TO LABORATORY STRATEGIC INITIATIVES

Identify below if the proposal is in support of RHIC, the Light Source, or any of the Strategic Initiatives that can be found listed at the LDRD web site, www.bnl.gov/ldrd.

7. POTENTIAL FUTURE FUNDING

Identify below the Agencies and the specific program/office, which may be interested in supplying future funding. Give some indication of time frame.

APPROVALS

Department /Division Administrator _____
Print Name

Department Chair/Division Manager _____
Print Name

Cognizant Associate Director _____
Print Name

BUDGET REQUEST BY FISCAL YEAR

Department
Title
PI

(Note: Funding for more than 2 years is unlikely and cannot exceed 3 years)

COST ELEMENT	**FISCAL YEAR** ____	**FISCAL YEAR** ____	**FISCAL YEAR** ____	TOTAL COST
Labor* Fringe Total Labor Organizational Burden @ ____ %				
DISTRIBUTED TECHNICAL SERVICES				
Materials Supplies Travel Services Total MST Materials Burden @ ____%				
TECHNICAL COLLABORATORS/ CONSULTANTS				
Sub-contracts Contracts Burden @ ____%				
Electric Power Other (specify)				
Traditional G&A @ _____% Common Support G&A @_____%				
TOTAL PROJECT COST				
*Labor (give levels of effort with names, or if unknown indicate TBD) **Scientific & Professional** **Post Doc** **Other**				
Note: The Budget Office covers 20% of the Post Doc's salary/fringe.				
List all Materials Costing Over $5,000				

LDRD DATA COLLECTION FORM

Read and then remove the instructions before attempting to complete this form and return it electronically to D. J. Greco (greco@bnl.gov)

LDRD PROJECT NUMBER:

PROJECT TITLE:

PRINCIPAL INVESTIGATOR(S):

PUBLICATIONS **TOTAL** _____

List all refereed publications originating in whole or in part from this LDRD including those that have been submitted, but do not include any that are in preparation during the fiscal year.

MEETINGS, PROCEEDINGS, AND ABSTRACTS **TOTAL** _____

List all formal presentations originating in whole or in part from this LDRD presented during the fiscal year.

REPORTS **TOTAL** _____

List all formal reports originating in whole or in part from this LDRD including those that have been published during the fiscal year.

PATENTS AND LICENSES **TOTAL** _____

List all patents and licenses originating in whole or in part from this LDRD during the fiscal year. Provide the total number above.

COPYRIGHTS TOTAL

List all copyrights (other than publications) originating in whole or in part from this LDRD granted during the fiscal year. Provide the total number above.

INVENTION DISCLOSURES **TOTAL** _____

List all invention disclosures submitted during the fiscal year to the Laboratory's Office of Intellectual Property & Sponsored Research that were either directly derived from this LDRD or from any follow-on efforts.

PROJECT REVIEWS **TOTAL** _____

List all formal review presentations that pertain to this work conducted during the fiscal year. Include the name of the reviewing body and date of review, title of presentation, and names of presenters. Do not include the mid-year LDRD program reviews. Provide the total number above.

STUDENTS AND RESEARCH ASSOCIATES **TOTAL** _____

Provide names of all graduate students and Research Associates supported during the fiscal year and give the number of months that they were supported. Provide the total number above combined as full-time equivalents, rounded to the nearest month.

NEW HIRES **TOTAL** _____

Provide names of any new staff that were hired during the fiscal year as a direct result of this LDRD. Provide the total number above.

FOLLOW-ON FUNDING **TOTAL** _____

List all requests for funding submitted during the current and prior fiscal years including any that have been rejected. Give the title of the project, the Principal Investigator, date of submission, the name of the agency, action taken, amount funded or requested per year, and the duration. Provide the total number above.

AWARDS **TOTAL** ____

Provide information on any national awards or recognitions received during the fiscal year that are attributable in whole or in part to the LDRD project. For each award, describe (in 150 words or less) its significance and the role that LDRD played in achieving it. Provide the total number above.

Office of Policy and Strategic Planning
Laboratory Directed Research and Development Program

BROOKHAVEN
NATIONAL LABORATORY

Building 815E
P.O. Box 5000
Upton, NY 11973-5000
Phone 631 344-4467
Fax 631 344-2887
newman@bnl.gov

managed by Brookhaven Science Associates
for the U.S. Department of Energy

Memo

date: *May 8, 2006*

to: *Distribution*

from: *L. Newman L.N.*

subject: *FY 2007 LDRD Proposals for Review*

We are about to enter the important process of selecting LDRD projects for support in the next fiscal year. As in the past, all of us will be asked to rate the proposals and participate in the discussions. However, only the ALDs will be involved in the final selection.

We have received 95 proposals in good order. Attached please find a table listing all of the proposals and a complete set of abstracts. The ALD, as the most qualified expert, will serve as the first proponent for all proposals in their Directorate. This is already so indicated as, 1P, in the table. In addition, the ALDs will serve as second proponents (2P) for approximately one quarter of the remaining proposals. There are five scientists from the Brookhaven Council who will also serve as second proponents, each to approximately one fifth of the proposals, with at least one half of these coming from outside of their respective Directorates.

In order to assign to each of you the proposals that you will feel most comfortable with reviewing, I request that on the attached table you indicate those proposals for potential review that you are highly interested in (H), moderately interested in (M), or have no interest in (N). The Brookhaven Council members have been recused, designated by a R, from all proposals emanating from their respective Departments and should recuse themselves from any others for which they might have a conflict of interest, such as being a Co-PI or collaborator. Email your selections to me (newman@bnl.gov) by May 15 and I will do my best to comply with your wishes in the assignment process.

We will then provide you with copies of all those proposals that you have been assigned, but as we assume that the ALDs have copies of the proposals in their Directorates we will not send them any of those. In addition, each of you will receive a complete set of abstracts. Prior to the onset of the first meeting you will be asked to provide your initial ratings for all proposals for which you are a proponent. I and Pat Looney will have read all the proposals prior to the meeting and will have also provided our ratings as third proponents. At the first meeting we will try to get consensus to eliminate, without discussion, those proposals that fared so poorly that they are deemed unlikely to be selected for funding. We will then embark upon discussions of each of the remaining proposals, led by the principal proponent with augmentation by the two

second proponents, upon which we will all be asked to provide ratings. Those of us that had already rated a proposal might opt to provide a revised number. A complete set of all the proposals will be available if you need to familiarize yourself with the full details of those proposals which you have not yet seen. At any time, if you wish to be more fully informed on a particular proposal, you can request to obtain an electronic version from D. J. Greco (Greco@bnl.gov). We will be using a rating process consisting of: highest priority (4), high priority (3), fund if possible (2), or low priority (1) and we request that you only use integers when making your ratings. Please remember when deciding upon your ratings that we will only be able to fund a small fraction of the proposals.

LN/dj
Table and Abstracts attachments
Distribution: ALDs
Council Scientists
K. Fox
N. Narain
J.P. Looney

FY07 Strategic Focus Areas

• **NSLS-II -** A state of the art ultra-bright medium energy storage ring delivering world leading performance. Its unique characteristics (spatial resolution of 1 nm and energy resolution of 0.1 meV) will open up new regimes of scientific discovery and investigation, and enable exploration of the correlation between nanoscale structure and function, the mechanisms of molecular self-assembly, and the science of emergent behavior, especially for correlated electron systems.

• **Evolution of RHIC to a QCD Lab** – The discoveries at RHIC have led to compelling questions about QCD and vice versa. Compelling questions have in turn prompted the need for evolution of the facility to further the study of QCD (quantum chromodynamics) experimentally and theoretically. The expectation is that the combination of RHIC, eRHIC, and QCDOC as a "QCD Lab" will play a major role in determining the nature of the quark-gluon plasma and the visible universe, the origin of the spin of the proton, and the role of the color glass condensate in the structure and interaction of high energy hadrons.

• **Nanoscience** – Through the development of materials exhibiting novel and unprecedented functionality for energy manipulation and utilization, nanoscience offers a new approach to address the energy security challenges facing the U.S. BNL will focus on energy security in the areas of nanostructured catalysts, electronic nanomaterials, and bio/soft nanomaterials and interfaces in order to develop the scientific foundation and tools for the design and creation of functional nanomaterials.

• **Translational Biomedical Imaging** – The combination of expertise in radiotracer chemistry,

imaging physics, and preclinical and clinical neuroscience will enable determination of how the brain develops, changes, and adapts to the environment over a life time; how drug addiction, obesity, and other disorders affect the brain; how genetic variations affect brain structure, biochemistry, and behavior; how drugs taken during pregnancy affect the brain of the fetus and adult offspring - with the ultimate goal of translating findings to clinical use.

• **Energy** – BNL will lead in the development of advanced materials and processes for energy applications, especially in the areas of catalysis, high performance materials, solar energy, and biologically-derived fuels.

• **Computational Science** – BNL will become the leading center for computational biology, nanoscience, and QCD as it builds up an interdisciplinary team of first-rate scientists and software experts that will use and operate a leadership class machine as a national user facility.

• **General** – Forefront areas of basic and applied science and technology for the primary purpose of enriching Laboratory capabilities.

Top

Program Description

The purpose of the Laboratory Directed Research and Development (LDRD) Program is to promote the conduct of highly innovative and exploratory research that fits into the mission of the Laboratory including strategic initiatives for the growth of the Laboratory. The Laboratory mission areas include advancements in physics, chemistry, and biology, and in medical, energy and environmental sciences, and in the utilization of the user facilities that include accelerators for particles, heavy ions, and synchrotron light. The following is a list of the general principles that guide the LDRD Program.

- Fund highly innovative and exploratory research

that can be of high risk.

- Expect high payoff such as funding prospects, breakthrough science and broadening of the Laboratory's mission.
- Set a fraction of the funds for strategic areas.
- Give some preference to emerging scientists consistent with the quality of their proposals.
- Collaborations across Directorates and Departments should be encouraged.
- Successful organization and execution of each approved proposal is the responsibility of an appointed Associate Laboratory Director (ALD) in the area of activity.
- ALDs as a group with the benefit of ratings from a committee make the final selections for the Laboratory-Wide Competition.
- Do not use the LDRD process as a way to support unfunded investigators.
- Track the productivity and success of funded proposals.
- Support stops if you obtain funding elsewhere.

Program Structure

The program has two categories, the annual competed LDRDs and Strategic LDRDs, which combine to meet the overall objective of the LDRD Program.

Competed LDRD Proposals

Proposals are solicited annually for review and approval concurrent with the next fiscal year, October 1. An LDRD Selection Committee, comprised of the Associate Laboratory Directors (ALDs) for the Scientific Directorates, an equal number of scientists recommended by the Science Council, plus the LDRD

Scientific Director, and the Assistant Laboratory Director for Policy and Planning, review the proposals submitted in response to the solicitation.

The competed LDRD category emphasizes innovative research concepts with limited management filtering to encourage the creativity of individual researchers. The competition is open to all BNL staff in programmatic, scientific, engineering, and technical support areas. Researchers submit their project proposals to the LDRD Scientific Director.

Strategic LDRD Proposals

A portion of the LDRD budget is held for the Strategic LDRD (S-LDRD) category. These funds are used to establish and enhance initiatives that are consistent with Laboratory priorities. Projects in this category focus on innovative R&D activities that are likely to develop new programmatic areas within BNL's mission responsibilities and enhance the Laboratory's science and technology base. The Laboratory Director entertains requests or articulates the need for S-LDRD funds at any time. The Director selects two people to provide written reviews of the proposals.

These Projects are driven by special opportunities, including:

- Research project(s) in support of a Laboratory strategic hire,
- Evolution of Program Development activities into research and development activities,
- ALD proposal(s) to the Director to support unique research opportunities,
- Research project(s) in support of Laboratory strategic initiatives as defined and articulated by the Director.

Administration

Further information and assistance can be obtained from Leonard Newman, Scientific Director for LDRD, either by email (ldrd@bnl.gov) or telephone (ext. 4467), or Kevin Fox, Special Assistant to the ALD for Finance, email ldrd@bnl.gov or telephone (ext. 6185).

Documentation on all approved LDRD projects is maintained by the LDRD Program to assure that projects have undergone proper review and are in compliance with all applicable requirements.

Exhibits

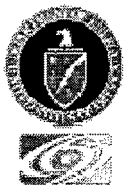
- Data Collection Form
- PIQ Form
- Sample Interim Status Report

LDRD Program Data

- FY 02 List of Funded Projects (PDF)
- FY 03 List of Funded Projects (PDF)
- FY 04 List of Funded Projects (PDF)
- FY 05 List of Funded Projects (PDF)
- FY 06 List of Funded Projects (PDF)
- FY 07 List of Funded projects (PDF)

Note: Depending on your browser configuration, PDF files may not open as expected. If you see a blank page or have other problems viewing these PDF files, see the list of common solutions.

Last Modified: November 8, 2006
Please forward all questions about this site to: Dorothy-Jean Greco



One of ten national laboratories overseen and primarily funded by the Office of Science of the U.S. Department of Energy (DOE), Brookhaven National Laboratory conducts research in the physical, biomedical, and environmental sciences, as well as in energy technologies and national security. Brookhaven Lab also builds and operates major scientific facilities available to university, industry and government researchers. Brookhaven is operated and managed for DOE's Office of Science by Brookhaven Science Associates, a limited-liability company founded by the Research Foundation of the State University of New York on behalf of Stony Brook University, the largest academic user of Laboratory facilities, and Battelle, a nonprofit, applied science and technology organization.

Introduction

This subject area describes the procedures for preparing, submitting, reviewing, and approving proposals for the Laboratory Directed Research and Development (LDRD) Program. It also describes the procedures for reporting on the status of LDRD projects.

The purpose of the LDRD Program is to encourage and support the development of ideas that could lead to new programs, projects, and directions for the Laboratory. The LDRD program focuses on early exploration and exploitation of creative and innovative concepts, which enhance the ability of the Laboratory to carry out its current and future mission objectives in line with the goals of the Department of Energy (DOE). This discretionary research and development tool is viewed as one important way of maintaining the scientific excellence of the Laboratory. It is a means to stimulate the scientific-technological community (foster new science and technology ideas), which is a factor in achieving and maintaining staff excellence, and is a means to address national needs within the overall mission of the DOE.

The LDRD program includes all discretionary research and development activities other than those provided for in a DOE/NNSA program or by specific designation in the Prime Contract

Program Structure

The program consists of two categories, Competed LDRDs and Strategic LDRDs, which combined, meet the overall objectives of the LDRD Program.

Competed LDRD Proposals

Proposals are solicited annually for review and approval concurrent with the next fiscal year, October 1. An LDRD Selection Committee, comprised of the Associate Laboratory Directors (ALD) for the Scientific Directorates, an equal number of scientists recommended by the Science Council, plus the LDRD Scientific Director, and the Assistant Laboratory Director for Policy and Planning, review the proposals submitted in response to the solicitation.

The competed LDRD category emphasizes innovative research concepts with limited management filtering to encourage the creativity of individual researchers. The competition is open to all BNL staff in programmatic, scientific, engineering, and technical support areas. Researchers submit their project proposals to the LDRD Scientific Director.

Strategic LDRD Proposals

A portion of the LDRD budget is held for the Strategic LDRD (S-LDRD) category.. These funds are used to establish and enhance initiatives that are consistent with Laboratory priorities. Projects in this category focus on innovative R&D activities that are likely to develop new programmatic areas within BNL's mission responsibilities and enhance the Laboratory's science and technology base. The Laboratory Director entertains requests or articulates the need for S-LDRD funds at any time.

These Projects are driven by special opportunities, including

- Research project(s) in support of a laboratory strategic hire,
- Evolution of Program Development activities into research and development activities,
- ALD proposal(s) to the Director to support unique research opportunities,
- Research project(s) in support of laboratory strategic initiatives as defined and articulated by the Director.

Contents

Section	Overview of Content (see section for full process)
1. Preparing, Submitting, Reviewing, and Approving Competed LDRD Proposals	• Complete Proposal Information Questionnaire. • Review and approve proposals. • Authorize funding.
2. Preparing, Submitting, Reviewing, and Approving Strategic LDRD Proposals	• Complete Proposal Information Questionnaire. • Review and approve proposals. • Authorize funding.
3. Preparing and Submitting Reports on LDRD Projects	• Submit status reports.

Definitions

Exhibits

Examples of Projects for LDRD Funding
Restrictions on LDRD Awards
Sample Interim Status Report

Forms

LDRD Data Collection Form
Proposal Information Questionnaire

S-LDRD Review Instructions

Training Requirements and Reporting Obligations

This subject area does not contain training requirements.

This subject area contains the following reporting obligations:

- Principal Investigators (PIs) submission of an annual status report by November 1 to the LDRD Scientific Director.
- PIs present an Annual LDRD Mid-year Project Review.
- For each year that the program is active and for two years after the completion of the project, PIs submit a LDRD Data Collection Form to the LDRD Scientific Director.
- LDRD Scientific Director submits an Annual Program Plan to the DOE BHSO by August 15
- LDRD Scientific Director submits an Annual Report to the DOE BHSO by March 31
- LDRD Scientific Director annually submits Project Data Sheets to the DOE BHSO by August 31
- LDRD Scientific Director annually submits the required information to OMBE/CFO Database
- LDRD Scientific Director annually submits to DOE Laboratory Policy Division data for Congressional report
- LDRD Scientific Director annually submits performance indicators data to DOE Laboratory Policy Division

See the section Preparing and Submitting Reports on LDRD Projects.

References

Laboratory Directed Research and Development (LDRD) Web site

Standards of Performance

Provide for strategic growth and investment in the Laboratory's programmatic mission and supporting assets through the following:

- Using Laboratory Directed Research and Development (LDRD);
- Maintaining an Annual Laboratory Plan through a process for formal strategic planning; and
- Maintaining a supportive work environment that fosters innovative scientific and technological research and analysis to serve customers needs, and staff development to address long-term organizational needs and staff career goals.

All staff shall ensure that the scientific and technical information resulting from BNL research is available to the maximum permissible extent for future use by the scientific community and the public within BNLs and the customer's requirements.

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Management System: Science and Technology Program Management

Subject Area: Laboratory Directed Research and Development (LDRD) Program

1. Preparing, Submitting, Reviewing, and Approving Competed LDRD Proposals

Effective Date: **Nov 4, 2004**	Subject Matter Expert: Kevin Fox	Management System Steward: Peter Bond

Applicability

This information applies to BNL staff who prepare, submit, review, and approve Laboratory Directed Research and Development (LDRD) Program proposals for funding.

Required Procedure

Proposals for an upcoming fiscal year will be solicited for submission and review. Awards will be made by the Laboratory Director based on the deliberations of the Selection Committee. Normally, LDRD projects will start shortly after the beginning of the fiscal year.

Step 1	The Scientific Director of the LDRD Program sends a call for competitive LDRD proposals early in the calendar year.
Step 2	The Principal Investigator completes the Proposal Information Questionnaire, which consists of an abstract and three-page proposal outlining the planned project. See the Examples of Projects for LDRD Funding exhibit for information on projects or studies that are considered candidates for the LDRD Program.
Step 3	The Department Administrator, Department Chair/Division Manager, and cognizant Associate Laboratory Director (ALD) review and approve the Proposal Information Questionnaire for accuracy and conformance with LDRD guidelines.

Step 4	The ALD transmits the Proposal Information Questionnaire to the LDRD Program Office.
Step 5	The LDRD Scientific Director will act as the Chair of the LDRD Selection Committee. The LDRD Selection Committee reviews the submitted proposals, obtains additional information deemed necessary, and selects the projects to be recommended for funding and the amount of each award. See the Restrictions on LDRD Awards exhibit for information on restrictions for LDRD funding. The total amount of funds to be made available for the program, and the number of projects supported, will vary from year to year, depending to a large extent on the Laboratory's overall financial situation, and on the amount approved by DOE.
Step 6	• The LDRD Scientific Director submits the recommended projects to the Laboratory Director for review and approval. • The Laboratory Director selects the projects to be funded and their funding levels.
Step 7	The LDRD Scientific Director submits: • Approved proposals to the Operations Security (OPSEC) Working Committee Chair for classification review and operational security considerations; • Data Sheets to DOE Brookhaven Site Office (BHSO) LDRD Project Manager for concurrence 45 days before the start of the fiscal year.
Step 8	The LDRD Scientific Director notifies the Principal Investigator and the cognizant Department Chair/Division Manager, and ALD when an LDRD research project is recommended for funding on or about Oct. 1. Notification of the authorization for funding will be made as soon as possible after the start of the fiscal year. Timing depends on the Congressional appropriations process and the budget outlook for the Laboratory.
Step 9	During the course of the projects The LDRD Scientific Director will submits Data Sheets to the DOE Brookhaven Site Office (BHSO) LDRD Project Manager for concurrence request for budget increases of greater than or equal to 50 percent over the DOE approved amount or $150,000, whichever is less. Cumulative budget increase up to $25,000 do no require concurrence.

Management System: Science and Technology Program Management

Subject Area: Laboratory Directed Research and Development (LDRD) Program

2. Preparing, Submitting, Reviewing, and Approving Strategic LDRD Proposals

Effective Date: **Nov 4, 2004**	Subject Matter Expert: Kevin Fox	Management System Steward: Peter Bond

Applicability

This information applies to BNL staff who prepare, submit, review, and approve Laboratory Directed Research and Development proposals for funding under the Strategic LDRD(S-LDRD) category.

Background

A portion of the LDRD budget is held for Strategic LDRD (S-LDRD) projects. Projects in this category focus on innovative R&D activities that are likely to develop new programmatic areas within BNL's mission responsibilities that are of strategic importance to the Laboratory which enhance the Laboratory's science and technology base. The Laboratory Director may articulate the need for S-LDRD funds at any time. This category provides the flexibility to define and develop potential strategic projects and increases the responsiveness to Laboratory scientists throughout the year. This category provides the flexibility to define and develop strategic projects or thrusts.

These Projects are driven by special opportunities, including

- Research project(s) in support of a laboratory strategic hire,
- Evolution of Program Development activities into research and development activities,

- Associate Laboratory Director (ALD) proposal(s) to the Director to support unique research opportunities,
- Research project(s) in support of laboratory strategic initiatives as defined and articulated by the Director.

Required Procedure

The Laboratory Director may entertain requests for S-LDRD funds from a variety of sources, notably the Science ALDs, the Deputy Director for S&T, or the Assistant Laboratory Director for Policy and Planning. The Laboratory Director may also articulate the need for S-LDRD funds to achieve one or more strategic objectives of the Laboratory in conjunction with Laboratory planning activities and request proposals to achieve these specified objectives.

Step 1	. Laboratory Director articulates the need for S-LDRD funds to achieve specified objectives of the Laboratory and issues guidance for collecting and reviewing proposals
Step 2	. Upon determination by the Laboratory Director of a need for S-LDRD Funds, the Assistant Laboratory Director for Policy and Planning notifies the Proposal Coordinator (PC) or Point of Contact (usually a cognizant ALD), the Assistant Laboratory Director for Finance, and the Scientific Director for LDRD of the need
Step 3	. The PC identifies Principal Investigator(s), consistent with the Director's guidance. Project proposal(s) encompassing the scope of the S-LDRD objectives are prepared using the Proposal Information Questionnaire. See the Examples of Projects for LDRD Funding exhibit for information on projects or studies that are considered candidates for the LDRD Program.
Step 4	The Department Administrator(s), Department Chair/Division Manager(s), and cognizant ALD(s) review and approve the Proposal Information Questionnaire(s).
Step 5	The PC or appropriate ALD(s) transmits the Proposal Information Questionnaire electronically to the LDRD Program Office. The LDRD Scientific Director examines the proposal for compliance with the LDRD requirements. See the Restrictions on LDRD Awards exhibit for information on restrictions for LDRD funding. In addition, Scientific Director of the S-LDRD Program arranges for the appropriate review in accordance with the Director's guidance utilizing the S-LDRD Review Instruction.(need hyper link)

Step 6	The Laboratory Director is presented with the proposal(s) and the proposal review(s). The Director determines whether the project(s) are to be funded and the amount of each award.
Step 7	The LDRD Scientific Director submits selected proposals to the • Operations Security (OPSEC) Working Committee Chair for classification review and operational security considerations; • DOE Brookhaven Site Office (BHSO) LDRD Project Manager for concurrence 45 days before the requested start date.
Step 8	The LDRD Scientific Director notifies the Principal Investigator, the cognizant Department Chair/Division Manager, and the ALD when an LDRD research project is authorized for funding.
Step 9	During the course of the projects The LDRD Scientific Director will submits Data Sheets to the DOE Brookhaven Site Office (BHSO) LDRD Project Manager for concurrence for budget increases of greater than or equal to 50 percent over the DOE approved amount or $150,000, whichever is less. Cumulative budget increase up to $25,000 do no require concurrence Principle Investigators (PIs) Submission of an annual status report by November 1 to the LDRD Scientific Director

Management System: Science and Technology Program Management

Subject Area: Laboratory Directed Research and Development (LDRD) Program

3. Preparing and Submitting Reports on LDRD Projects

Effective Date: **Nov 4, 2004**	Subject Matter Expert: Kevin Fox	Management System Steward: Peter Bond

Applicability

This information applies to BNL staff who prepare and submit status reports to the LDRD Scientific Director on LDRD projects.

Required Procedure

The Principal Investigator submits reports to the LDRD Scientific Director.

Step 1	After the start of the project, submit an interim annual status report by November 1 to the LDRD Scientific Director. Use the format of the Sample Interim Status Report exhibit. Also complete and submit an LDRD Data Collection Form. **Note:** These status reports should provide a brief summary (outlining purpose, approach, and status or progress of two pages or less) of the results of the LDRD project. Projects of more than one year should only summarize progress since the previous report. Additionally, the status report must also identify significant findings or accomplishments, papers, publications, patents, follow-on funding (includes funds requested or approved by DOE or from other agencies), support of post docs or students, presentations, and copyrights. For multi-year projects, the goals for the following years should be updated in view of the previous year's experience.
Step 2	For two years after the completion of the project, only submit the LDRD Data Collection Form to the LDRD Scientific Director.

The only official copy of this file is the one on-line in SBMS.

Before using a printed copy, verify that it is the most current version by checking the *last modified date* (at the top of each subject area and bottom of other pages/document).

Definitions: Laboratory Directed Research and Development (LDRD) Program

Effective Date: **Nov 15, 2004**	Point of Contact: Kevin Fox

Term	Definition
Laboratory Directed Research and Development (LDRD) Program	Encourages and supports the development of new ideas and technology, promotes the early exploration and exploitation of creative and innovative concepts, and develops new "fundable" R&D projects and programs.

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Filename: /sbmsearch/subjarea/99/SAdef.cfm Last Revised: 04/19/2005 10:23:47 AM

Management System: ***Science and Technology Program Management***

Subject Area: ***Laboratory Directed Research and Development (LDRD) Program***

Examples of Projects for LDRD Funding

Effective Date: **Nov 15, 2004**

Projects or studies that are appropriate candidates for the Laboratory Directed Research and Development Program (LDRD) are normally small, ranging from $50,000 to $200,000 per year, with a preference for smaller projects. They are generally funded for periods of two years with a possible continuation for a third year. Typically, they include the following:

- Projects in the forefront areas of basic and applied science and technology relevant to DOE/NNSA missions while enriching Laboratory capabilities;
- Advanced study of new hypotheses, new concepts, or innovative approaches to scientific or technical problems;
- Experiments and analyses directed toward "proof of principle" or early determination of the utility of new scientific ideas;
- Conceptual and preliminary technical analysis of experimental facilities or devices.

Program

Restrictions on LDRD Awards

Effective Date: **Nov 15, 2004**

The purpose of the LDRD program is to develop new, fundable programs at the Laboratory. As such, the work proposed should be consistent with the missions of the Laboratory, the Department of Energy (DOE). In this regard, the Annual Laboratory Plan and Agency program documents serve as guidance.

- Awards will not be made to substitute for, or increase funding for any tasks for which Congress or the DOE has established a specific limitation, or for any specific tasks that are funded by DOE or other users of the Laboratory.
- Projects will be modest in size and limited to 3 years or less.
- Awards will not fund activities that will require the addition of non-LDRD funds to reach a useful stage of completion.
- The LDRD study will not fund
    1. Construction line-item projects, in whole or in part;
    2. Construction design beyond the preliminary phase (e.g., conceptual design, Title I design work, or any similar or more advanced effort may not be supported),
    3. Capital equipment expenditures.

BROOKHAVEN NATIONAL LABORATORY
LABORATORY DIRECTED RESEARCH AND DEVELOPMENT (LDRD) PROGRAM

STRATEGIC LDRD PROPOSAL REVIEW

PRINCIPAL INVESTIGATOR			**PHONE**	
DEPARTMENT/DIVISION			**DATE**	
OTHER INVESTIGATORS				
TITLE OF PROPOSAL				
PROPOSAL TERM (month/year)	From		Through	

RECOMMENDATION

_____ **Provide a rating between 1 to 5 with 5 being the highest**

Reviewers Signature	**Print Name**	**Date**

REVIEW

Instructions

Proposals submitted for funding under the Strategic LDRD category are directed to focus on innovative R&D activities that are likely to develop new programmatic areas within BNL's mission responsibilities. The Director has selected the area of the attached proposal to be of particular strategic importance to the Laboratory. Accordingly, on this page provide a short review of the proposal addressing **only** (1) the quality of the proposed science and (2) the credentials of the PI to carry out the research. Provide the rating as indicated above. Send your review to Leonard Newman, LDRD scientific Director, both electronically (newman@bnl.gov) and a hard copy (Building 815E).

Remove these instructions, before entering your review.

March 13, 2006
Volume 8 - Number 5

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SOLICITATION FOR FY07 LDRD PROPOSALS - Leonard Newman

The Laboratory-Directed Research and Development (LDRD) program office recently sent out our annual call for proposals for the LDRD competition, and I would like to further encourage people to send in proposals. As I've mentioned in past Monday Memos, research conducted under the LDRD program should be highly innovative, and an element of high risk as to success is acceptable.

This year we will be pleased to receive innovative new projects in support of the following Laboratory Strategic Focus Areas: NSLS II, Evolution of RHIC to a QCD Lab, Nanoscience, Translational and Biomedical Imaging, Energy, and Computational Science. Let me hasten to add, however, that we are by no means restricting the solicitation only to those areas, and will entertain all good proposals on other "general topics" that enhance and enrich the goals and capabilities of the Laboratory.

An elaboration of these initiatives can be found at the LDRD web site, www.bnl.gov/ldrd. We are especially interested in proposals that involve multidisciplinary talents and that cross departmental lines. These proposals can be budgeted at somewhat higher levels. The total amount of money for new starts in FY07 has not yet been determined, but could be as high as $6.5 million.

As we did last year, we are requesting that proposals be submitted electronically, by e-mail, through your respective chairperson and associate laboratory director to D.J. Greco (greco@bnl.gov) by April 17, 2006.

The Proposal Information Questionnaire submission form has been somewhat revised and can also be found at the LDRD web site. Please note that we require a program summary that fits on the first page of the form, and a proposal that is no more than three pages in length and that we no longer require a "milestone chart." Also, while LDRD projects are restricted to a maximum of three years, we ask that projects and their budgets, which now must include G&A, be tailored to no more than a two-year schedule. Each year, approved projects will undergo a mid-year review to assess progress.

The BNL LDRD Policy, which defines the LDRD program, can be found on the web site. I will chair the selection committee, which includes the Assistant Laboratory Director for Policy and Strategic Planning, the Deputy Director for Science and Technology, the Associate Laboratory Directors, and is augmented by selected distinguished scientists. The committee hopes to conclude the selection process by the end of July. In my capacity as Scientific Director for LDRD, I am available to counsel individuals to aid them in their preparation of a successful proposal.

- Leonard Newman
Scientific Director, LDRD program
newman@bnl.gov

(07-001) QCD Thermodynamics at Non-zero Temperature and Density
F. Karsch (FY 2007 Funding $393,000)

Explore properties of Quantum Chromo Dynamics (QCD) at non-zero baryon chemical potential using methods suitable for studies of the canonical and grand canonical partition function of QCD. Will use numerical computations to determine the coefficient in high order series expansions that allow to estimate the location of the critical point.

(07-002) Lattice QCD Semulations on BlueGene/L
F. Karsch (FY 2007 Funding $148,000)

Plan to implement and optimize lattice simulation programs on BlueGene/L (BG/L). Also develop new programs specific to the need of lattice studies of Quantum Chromo Dynamics (QCD) thermodynamics.

(07-004) Proof-of-Princple Laser System for ILC Positron Source
I. Pogorelsky (FY 2007 Funding $92,000)

Propose initial demonstration in developing a practical approach to a polarized gamma source for producing positrons for the International Linear Collider (ILC) and the Compact Electron Positron Collider (CLIC) PPS; this design requires convincing experimental proof of feasibility.

(07-005) Sensitive Searches for CP-Violation in Hadronic Systems
Y. Semertzidis (FY 2007 Funding $86,000)

Seek to investigate (P)-symmetry and (T)-symmetry violating interactions in two hadronic systems. This will involve the analysis of the STAR data and investigating CP-violation in hot matter in collisions of heavy ions at RHIC. An additional aspect involves the development of the storage ring deuteron EDM (dEDM) proposal searching for CP-violation in ordinary temperature matter.

(07-006) Feasibility and Design Studies for a Detector for e+p, e+A, p+p, p+A, and A+A Collisions at BNL
T. Ullrich (FY 2007 Funding $79,500)

Investigate the possibility of designing a new quantum chromodynamics "QCD lab detector" that will allow the study of e+p, e+A, as well as p+p, p+A, and A+A collisions with unprecendented coverage and precision would allow the exploration of all aspects of QCD.

(07-007) A Novel and Compact Muon Telescope Detector for QCD Lab
Z. Xu (FY 2007 Funding $90,000)

Propose an R&D research on a large-area and cost-effective muon telescope detector (MTD) for RHIC and for next generation detectors at future QCD Lab from state-of-art multi-gap resistive plate chamber (MRPC) and large module and long strips.

(07-010) Design Optimization of a Reactor Neutrino Experiment
D. Jaffe (FY 2007 Funding $94,000)

Develop simulation tools for reactor-based neutrino oscillation experiments. Wish to adapt and further develop the present GEANT4-based simulation program under development by the Daya Bay collaboration.

(07-019) Development of Laser Beam Shaper for Low Emittance Electron Beams
T. Rao (FY 2007 Funding $149,000)

Evaluate different temporal and spatial modulators to shape a train of ultrafast light pulses to the format desirable for RHIC II and eRHIC. Select a suitable scheme, design and construct a modulator to deliver rectangular and ellipsoidal shapes from a Ti:sapphire laser oscillator. Amplify the shaped light pulses in an existing amplifier to investigate the effect of the amplification on the pulse shape. Perform appropriate diagnostics and establish a feedback routine for optimization.

(07-023) Surface Engineered and Core-Shell Nanowires: Nanoscale Building Blocks for Third Generation Photovoltaics
P. Sutter (FY 2007 Funding $124,000)

Focuses on exploring the synthesis, electronic, and optoelectronic properties of semiconductor nanowires with controlled surface termination, and of nanowire-based core-shell structures.

(07-025) Precision Assembly of Nano-Objects – Approaching Artificial Photosynthesis
W. Sherman (FY 2007 Funding $97,000)

Develop approaches for the precise positioned control of nano-objects in DNA scaffolds down to the sub-nanometer scale by building DNA cages that will hold individual nanoparticles at their centers via multiple addressable links and that will pave the way for future work assembling artificial photosynthetic systems with positional and orientation control.

(07-027) Photocatalytic Carbon Dioxide Reduction to Methanol using Metal Complexes with an NADH Model Ligand
E. Fujita (FY 2007 Funding $124,000)

Explore CO2 reduction to methanol employing a new methodology to photochemically produce hydride donors using functionalized metal complexes with a reduced nicotinamide adenine dinucleotide (NADH) model ligand. Seeks to emulate natural photosynthetic systems for catalytic hydrogenation/reduction of CO2 beyond CO and HCOO-. A combination of experimental and theoretical approaches will be pursued to investigate the mechanism and

kinetics of several promising transition-metal complexes with NADH-model ligands for the photocatalytic reduction of CO2 to methanol.

(07-030) Structure of Mass-Size Selected Nanoparticles by Scanning Transmission Electron Microscopy
M. White (FY 2007 Funding $94,000)

Propose to combine the unique capabilities of a newly developed size-selective deposition apparatus and the BNL scanning electron microscope facility to study the atomic structure of metal compound nanoclusters that represent model systems for heterogeneous catalysis. Would allow the atomic structure of small, metallic nanoclusters to be determined through measurements of single-particle electron diffraction using scanning transmission electron microscopy (STEM). Would directly address the critical need to understand how the electronic structure and chemical activity of supported nanoparticles correlates with atomic structure as the particle size changes.

(07-032) Synthesis of Conjugated polymers for Fundamental Questions in Solar Energy
J. Miller (FY 2007 Funding $113,000)

Aims to develop a multidisciplinary capability for innovative synthesis and spectroscopic characterization of soft matter in the form of conjugated polymers, which can help us to understand the fundamental approaches in increasing the efficiency of the polymer solar cells. This capability will be built from combining the expertise in polymer synthesis and the expertise in ultrafast spectroscopic studies of charge transfer.

(07-035) Ultra-thin Graphite Analog Compounds
L. Cooley (FY 2007 Funding $87,000)

Seeks to develop single layer control of planar materials based on sp2 bonding to make novel compounds and heterostructures. Will explore monolayer graphite and its analogs deposited on single-crystal substrates with the A1B2 structure. Will use chemical vapor deposition in conjunction with the planned facility to be installed in the CFN, to make some monolayers. Intend to generate model samples for attacking basic issues in correlated electron phenomena, such as using spin to split electron levels, novel quantum-hall effects, ballistic transport, and high-temperature superconductivity.

(07-036) Lipid-Coated Nanoparticles and Their Interactions with Lipid Membrane Surfaces
M. Fukuto (FY 2007 Funding $94,000)

Objectives are: (a) to make use of lipid membrane coatings to render inorganic nanoparticles (NPs) both bio-compatible and bio-functional, via protein inclusion or binding; and (b) to study the interactions between such NPs and lipid membrane surfaces. Primary goals are: (i) to establish the expertise in coating NPs of various sizes with simple lipid bilayer membranes, and (ii) to investigate the interactions of lipid-coated NPs (LCNPs) with simple model lipid membrane surfaces and to identify the parameters that promote membrane fusion.

(07-038) Angle-Resolved Time-of-Flight Ion Scattering Spectroscopy from MBE-Grown Oxide Thin Film Surfaces
A. Gozar (FY 2007 Funding $68,000)

Propose to develop a new technique, Angle-Resolved Time-Of-Flight Ion Scattering and Recoil Spectroscopy (ARTOFIS), to determine the crystallographic structure of surfaces with unprecedented (<0.1 Angstrom) resolution. Propose to combine this detector with angular resolution for the first time to develop an ultra-high precision surface crystallographic capability.

(07-040) Genome Analysis of Endophytic Bacteria that Promote Growth of Poplar for Biomass Production
S. Taghavi (FY 2007 Funding $259,000)

Aim is to identify genes used by endophytic bacteria to enter and stimulate the biomass production of their host in order to optimize this concept for improved poplar biomass production. Propose to assemble genomes of 4 bacteria, to set up a genome annotation platform, to annotate their genomes, to perform data mining in order to identify endophytic functions involved in plant colonization and stimulation of plant growth, and to use directed mutagenesis for confirmation of gene functions.

(07-041) Structural Features of the Oxygen Tolerant Hydrogenase from Thermatoga Neapolitana
D. Van der Lelie (FY 2007 Funding $269,000)

This project aims at determining which features of the [FeFe]-hydrogenase complex are responsible for the observed oxygen tolerance. Obtain sufficient purified T. neapolitana [FeFe]-hydrogenase complex to perform a detailed study of its oxygen tolerance and to functionally overexpress the protein in E. coli.

(07-047) Characterization of Enzymatic O-acylation to Facilitate Biomass and Bioenergy Production
C.-J. Liu (FY 2007 Funding $131,000)

Propose an integrated biochemical genomics approach of combining bioinformatics analysis, protein homology modeling-based functional prediction, transcriptional profiling, and in vitro enzymatic assay to systemically characterize poplar acyl-CoA dependent acyltransferases that are involved in O-acylation of cell-wall lignocelluloses and heartwood forming metabolites, and to further explore the catalytic mechanism of acyltransferase in modification of cell-wall structural components and non-structural metabolites.

(07-048) Functional Neurochemistry
D. Tomasi (FY 2007 Funding $125,000)

Aim to develop 1) novel radio frequency (RF) surface coils for high field MRI/MRS with enhanced sensitivity, 2) novel pulse sequences for localized 1H-fMRS with high temporal resolution, and 3) novel data analysis methods to dynamically explore brain neurochemistry and function. Will use brief as well as prolonged blocked visual stimulation to induce measurable

changes of metabolite concentrations in primary visual cortices, while fMRI and fMRS will be acquired in an interleaved fashion.

(07-054) Miniaturized RF Coil Arrays for MicroMRI
D. Smith (FY 2007 Funding $90,000)

Propose to develop novel, high performance radio frequency (RF) coil arrays for improved imaging on the Medical Department's 9.4 Tesla (400 mhz) micro MRI system. Will construct a variety of new coil arrays developed specifically for use in the 'parallel imaging' mode.

(07-055) *Neurocomputation* at BCTN: Developing Novel C omputational Techniques to Study Brain Function in Health and Disease
R. Goldstein (FY 2007 Funding $150,000)

Create a fully integrative PET-fMRI-ERP neurocomputational network, map of the cogent human brain at the chemical metabolic (PET), anatomical and psychologically functional (fMRI, ERP) domains. Will bridge PET, fMRI and ERP technologies to develop a state-of-the-art neurocomputational platform supporting multi-dimensional computational analysis of the human brain (chemical, metabolic, anatomical and psychologically functional).

(07-059) A Non-Fermentation Route to Convert Biomass to Bioalcohols
D. Mahajan (FY 2007 Funding $92,000)

Propose a novel non-fermentation approach to ethanol synthesis that will utilize syngas produced by gasification ("thermochemical route") of low-moisture content biomass such as wood chips or switchgrass. The first step involves design of a metal catalyst that can deliver high turnover numbers for syngas to methanol transformation under mild conditions of temperature (100o – 130oC) and pressure (2-5 MPa). The second step requires efficient and selective catalyzed homologation of methanol to ethanol with base activated nanosized Ni-Ru catalyst at T < 200oC to promote dehydration.

(07-062) Fate and Reactivity of Carbon Nanoparticles (CNPs) Exposed to Aqueous Environmental Conditions
K. Crosson (FY 2007 Funding $94,000)

Electron diffraction will be used to study nanoscale changes in cabon nanoparticles (CNPs) morphology, surface charge, and chemical functionality to elucidate the nature and mechanisms of environmentally-induced CNP alterations and reactivity; revealing the potential risks of discarded CNPs.

(07-073) Development of Room-Temperature CdMnTe Gamma-Ray Detectors
Y. Cui (FY 2007 Funding $94,000)

Develop new detectors based on CdMnTe (CMT) which has the requirements for a low-cost, good-resolution room-temperature gamma-ray detector. These are demands not yet covered by General compact room-temperature semiconductor detectors.

(07-075) Developing a New Framework for Investigating Earth's Climate and Climate Change
Y. Liu (FY 2007 Funding $94,000)

Develop a new framework for studying earth's climate and climate change by examining the role of entropy (budget) in shaping earth's climate and its change. The second objective is to seek simple guiding principles that govern earth's climate as a whole without knowing the microscopic details.

(07-080) A Novel Approach for Efficient Biofuel Generation
D. Chidambaram (FY 2007 Funding $80,000)

Propose to create for the first time a non-woven mat of microbe encapsulated polymer fibers that can be used in the fermentation process to harvest electron-accepting chemical species as useful current. Porous fibers will allow the organism to respire and communicate with the environment, thereby providing us with a fast and economical method to immobilize functionally-active bacteria in a non-reactive matrix.

(07-084) Investigations of Hygroscopic Growth and Phase Transitions of Atmospheric Particles by Noncontact Atomic Force Microscopy
S. Schwartz (FY 2007 Funding $90,000)

Propose to conduct laboratory studies of the surface interaction of insoluble materials (graphite, silica) representative of atmospheric aerosols with atmospheric salts and acids thought to be responsible for the increasingly hydrophilic so-called "aging" process. Studies will consist of deposition of these species onto well-characterized surfaces and examination of the extent of wetting of the surfaces as indicated by the beading up versus spreading of the materials on the surface.

(07-089) Chemical Imaging of Living Cells in Real Time
L. Miller (FY 2007 Funding $86,000)

Develop methods for high-resolution, chemical (infrared) imaging of living cells in real time. Propose to develop a specialized incubator for living cells which will be coupled to an infrared microscope with a new focal plane array detector system, where a 16-pixel array is used to imagine large areas quickly.

(07-090) Coherent Bragg Rod Analysis of High-Tc Superconducting Epitaxial Films
R. Pindak (FY 2007 Funding $86,000)

Propose to apply density maps that have enhanced our understanding of Gd2O3 passivation of a GaAs substrate and the ferroelectric polarization of a PbTiO3 epitaxial layer on SrTiO3 to measure the structure of high-temperature superconducting (HTS) thin films. Will utilize the state-of-the-art atomic-layer-by-layer molecular beam epitaxy system.

(07-091) Development of a Planar Device Technology for hyperpure Germanium X-ray Detectors
D.P. Siddons (FY 2007 Funding $131,000)

Propose to investigate the basic components required to arrive at a way to fabricate the germanium analog of modern silicon X-ray detectors such as drift detector arrays, fully depleted CCDs, and fully depleted pixilated structures with simplified read-out.

(07-096) Study of Epigenetic Mechanisms in a Model of Depression
F. Henn (FY 2007 Funding $325,000)

Work out a method to examine the changes in gene expression due to early environmental stress in two lines of genetically defined rat strains.

(07-097) Polarized Electron SRF Gun
I. Ben-Zvi (FY 2007 Funding $150,000)

Propose to carry out research on the feasibility of using a superconducting, laser-photocathode RF electron gun (SRF photoinjector) for the production of polarized electrons. Will demonstrate that a SRF photoinjector can be used at the International Linear Collider (ILC) to eliminate the need for an electron damping ring. Such a gun would be at the heart of the linac for eRHIC and thus have a large impact on the future of the QCD laboratory strategic initiative at BNL.

(07-098) New Approach to H Production Stages and Use
W. Han (FY 2007 Funding $385,000)

Will consider several aspects of these problems, including theoretical studies of H production from water-splitting, H-storage through the development of novel boron nitride nanotubes (BNNT), and investigation of hydrogen oxidation catalysts in fuel cells.

Relatedness to Lab Initiatives

Project Number	Title
NSLS II	
05-044	Intense THz Source & Application to Magnetization Dynamics
06-044	New High-Resolution X-Ray Monochromators for Condensed-Matter Science Experiments
06-046	Novel Materials for Hard X-Ray Optics
06-047	Nano-Crystallography of Individual Nanotubes and Nanoparticles
06-052	High-Temperature Superconducting Magnet Development
Evolution of RHIC to a QCD Lab	
06-001	Lattice Studies of QCD Thermodynamics on the QCDOC
06-017	Transmission Photocathode Development
07-001	QCD Thermodynamics at Non-zero Temperature and Density
07-002	Lattice QCD Simulations on BlueGene/L
07-005	Sensitive Searches for CP-Violation in Hadronic Systems
07-006	Feasibility and Design Studies for a Detector for e+p, e+A, p+p, p+A, and A+A Collisions at BNL
07-007	A Novel and Compact Muon Telescope Detector for QCD Lab
07-019	Development of Laser beam Shaper for Low Emittance Electron Beams
07-097	Polarized Electron SRF Gun
Nanoscience	
04-038	Complex Thin Films and Nanomaterial Properties
05-041	Multifunctional Nanomaterials for Biology
05-048	Nano-Imaging of Whole Cells with Hard X-Ray Microscopy
05-104	Giant Proximity Effect (GPE) in High-Temperature Superconductors
05-114	Study of High-Tc Nanostructures
06-012	Detector for High Quality Images of Electron Microscopy
06-021	Synthesis and Characterization of Band-Gap-Narrowed TiO2 Thin Films and Nanoparticles for Solar Energy Conversion
06-026	Multiscale Analysis of In Vivo Nanoparticle Exposure
06-037	Electronic Properties of Carbon Nanotubes and Novel Multicomponent Nanomaterials
06-039	Design, Synthesis and Characterization of a New Class of Hydrocarbon Polymers Containing Zwitter Ions and Nanostructured Composites for High Temperature Membrane in PEM Fuel Cells
06-047	Nano-Crystallography of Individual Nanotubes and Nanoparticles
06-066	Transformation and Fate of Nanomaterials in the Environment
06-092	Nanoparticle Labeled Neural Stem Cell Tracking In Vivo by Magnetic Resonsance Microscopy
07-023	Surface Engineered and Core-Shell Nanowires: Nanoscale Building Blocks for Third Generation Photovoltaics
07-025	Precision Assembly of Nano-Objects – Approaching Artificial Photosynthesis
07-030	Structure of Mass-Size Selected Nanoparticles by Scanning Transmission Electron Microscopy
07-036	Lipid-Coated Nanoparticles and Their Interactions with Lipid Membrane Surfaces
07-038	Angle-Resolved Time-of-Flight Ion Scattering Spectroscopy from MBE-Grown Oxide Thin Film Surfaces
07-062	Fate and Reactivity of Carbon Nanoparticles (CNPs) Exposed to Aqueous Environmental Conditions

Translational Biomedical Imaging	
05-068	Positron Labeled Stem Cells for Non-Invasive PET Imaging Studies of In-Vivo Trafficking and Biodistribution
05-070	Novel Multi-Modality MRI and Transcranial Magnetic Stimulation to Study Brain Connectivity
05-072	Feasibility of CZT for Next-Generation PET Performance
06-026	Multiscale Analysis of In Vivo Nanoparticle Exposure
06-088	Neurogenomics: Collaboration Between the Biology Department and the Brookhaven Center for Translational Neuroimaging to Investigate Complex Disease States
06-092	Nanoparticle Labeled Neural Stem Cell Tracking In Vivo by Magnetic Resonsance Microscopy
06-094	MicroCT Methods of Quantitative Adipose Imaging: Development of a Long-Term Assessment Technique for Studying Obesity in a Roden Model
07-048	Functional Neurochemistry
07-054	Miniaturized RF Coil Arrays for MicroMRI
07-089	Chemical Imaging of Living Cells in Real Time
07-096	Study of Epigenetic Mechanisms in a Model of Depression
Energy	
05-028	Behavior of Water on Chemically Modified Semiconductor Surfaces: Toward Photochemical Hydrogen Production
06-021	Synthesis and Characterization of Band-Gap-Narrowed TiO2 Thin Films and Nanoparticles for Solar Energy Conversion
06-039	Design, Synthesis and Characterization of a New Class of Hydrocarbon Polymers Containing Zwitter Ions and Nanostructured Composites for High Temperature Membrane in PEM Fuel Cells
06-061	Diversification of Isoflavonoid Biosynthesis
06-074	Aluminum Hydride - An Ideal Hydrogen Source for Small Fuel Cells
06-097	Photocatalytic Reduction of CO_2 in Supercritical CO_2
07-023	Surface Engineered and Core-Shell Nanowires: Nanoscale Building Blocks for Third Generation Photovoltaics
07-025	Precision Assembly of Nano-Objects – Approaching Artificial Photosynthesis
07-027	Photocatalytic Carbon Dioxide Reduction to Methanol using Metal Complexes with an NADH Model Ligand
07-032	Synthesis of Conjugated Polymers for Fundamental Questions in Solar Energy
07-035	Ultra-thin Graphite Analog Compounds
07-040	Genome Analysis of Endophytic Bacteria that Promote Growth of Poplar for Biomass Production
07-041	Structural Features of the Oxygen Tolerant Hydrogenase from Thermatoga neapolitana
07-047	Characterization of Enzymatic O-acylation to Facilitate Biomass and Bioenergy Production
07-059	A Non-Fermentation Route to Convert Biomass to Bioalcohols
07-080	A Novel Approach for Efficient Biofuel Generation
07-098	New Approach to H Production, Stages and use
Computational Science	
05-074	Biology on Massively Parallel Computers
07-055	*Neurocomputation at BCTN*: Developing Novel Computational Techniques to Study Brain Function in Health and Disease

Life Sciences	
05-058	Development of Methodologies for Analyzing Transcription Factor Binding in Whole Genomes
06-056	Epigenetics: Mathamphetamine (MAP)-Induced Brain Dysfunction and Methylation of DNA
06-060	Molecular Mechanism of Chromosomal Replication Initiation in Eukaryotic System
06-061	Diversification of Isoflavonoid Biosynthesis
06-065	Metabolic Flux Analysis in Arabidopsis Thaliana
07-055	*Neurocomputation at BCTN*: Developing Novel Computational Techniques to Study Brain Function in Health and Disease
Nuclear Particle Physics (NPP)	
05-006	Heavy Ion Physics with the ATLAS Detector
06-004	Detector Development for Very Long Baseline Neutrino Exp.
06-030	Development of Gadolinium-Loaded Liquid-Scintillators with Long-Term Chemical Stability for a New High-Precision Measurement of the Neutrino Mixing Angle, Theta-13
07-004	Proof-of-Principle Laser System for ILC Positron Source
07-010	Design Optimization of a Reactor Neutrino Experiment
Detectors	
06-038	Growth and Characterization of CdZnTe Crystals for Improved Nuclear Radiation Detectors
06-087	Gamma Ray Imager for National Security Applications
07-073	Development of Room-temperature CdMnTe Gamma-ray Detectors
Energy, Environment & National Security (EENS)	
06-071	Development of a Cloud Condensation Nucleus Separator
07-075	Developing a New Framework for Investigating Earth's Climate and Climate Change
07-084	Investigations of Hygroscopic Growth and Phase Transitions of Atmospheric Particles by Noncontact Atomic Force Microscopy
Basic Energy Science	
07-090	Coherent Bragg Rod Analysis of High-Tc Superconducting Epitaxial Films
07-091	Development of a Planar Device Technology for Hyperpure Germanium X-ray Detectors.

Department of Energy
Washington, DC 20585

MAR 1 3 2006

MEMORANDUM FOR DISTRIBUTION

FROM: SUSAN J. GRANT
CHIEF FINANCIAL OFFICER

SUBJECT: Laboratory Directed Research and Development

The Energy and Water Appropriations Act, 2006, PL 109-103, enables the Secretary of Energy to authorize at DOE-owned, contractor operated laboratories, an amount not to exceed eight percent for the conduct of Laboratory Directed Research and Development (LDRD) and an amount not to exceed three percent for Plant Directed Research and Development (PDRD) and Site Directed Research and Development (SDRD). The Act also authorizes, beginning in fiscal year 2006 and thereafter, all laboratories to be eligible for LDRD funding. The accompanying Conference Report, HR 109-275, requires the Secretary to apply overhead charges to LDRD, PDRD, and SDRD activities consistent with cost accounting practices for direct funded program activities and to implement these changes within 180 days of enactment.

The purpose of this memorandum is to provide implementing guidance for these changes to LDRD and PDRD activities. Guidance on SDRD will be provided under separate cover. To comply with the Congressional direction, these changes are to be implemented no later than May 19, 2006.

Pursuant to guidance issued by this office in 1996, LDRD and PDRD have been treated in a manner consistent with the method for distributing the general and administrative (G&A) expenses of a site. In most cases, this was accomplished by including LDRD/PDRD costs in the pool of G&A expenses. To implement the new requirements, it will be necessary to now fully burden LDRD and PDRD projects with indirect costs consistent with the methodology for burdening direct projects at each site. Each site's Cost Accounting Standards Disclosure Statement should be modified, as appropriate, to reflect these changes.

Implementation of this requirement may require removal of LDRD/PDRD from the site's G&A pool, depending on the site's business system flexibility for burdening indirect cost pools. Discussions with the Financial Management Systems Improvement Council (FMSIC) resulted in a FMSIC recommendation for removing LDRD/PDRD from the G&A pool and establishing a separate LDRD and PDRD pool and rate. If the FMSIC proposal is adopted by a site, the residual G&A expenses (after removal of LDRD/PDRD from the pool) and other indirect costs will need to be applied to LDRD/PDRD activities in a manner consistent with their application to program activities.

It is clear from the statutory and report language that the intent of Congress in making these changes was not to reduce the size of the LDRD/PDRD programs at the sites. Increasing the maximum LDRD recovery from six percent to eight percent (and PDRD from two percent to three percent) was intended to mitigate the impact of burdening LDRD/PDRD. If implemented equitably, the changes described above should not decrease the level of research conducted under the LDRD/PDRD programs or increase the cost of DOE programs or work for non-DOE customers.

As the legislation expands the LDRD program to laboratories not previously authorized to participate, any such expansion must be coordinated with the cognizant Lead Program Secretarial Officer and the LDRD program must be conducted in accordance with the implementation guidance provided in this memorandum.

If you have any questions regarding this guidance, please contact Dean Olson, Director, Office of Financial Policy, at (202) 586-4860.

DISTRIBUTION

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David K. Garman, ESE-1
Raymond L. Orbach, SC-1
Douglas L. Faulkner, EERE-1
R. Shane Johnson, NE-1
James A. Rispoli, EM-1

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Department of Energy
Office of Science
Washington, DC 20585

Office of the Director

March 17, 2006

Dr. Praveen Chaudhari
Director
Brookhaven National Laboratory
P.O. Box 5000
Upton, New York 11973-5000

THRU: Michael D. Holland
Manager
Brookhaven Site Office

Dear Dr. Chaudhari:

Based on Congressional direction to change the treatment of laboratory directed research and development (LDRD) costs at the laboratories, this letter provides approval of a revised FY 2006 LDRD maximum funding level of $13.5 million for Brookhaven National Laboratory. The new funding level will allow the laboratory to implement the directed accounting change with no impact on the research being conducted under the LDRD program. As always the Laboratory needs to continue to conduct its LDRD program in full compliance with Departmental policy.

If you have any questions, please contact John LaBarge on (202) 586-9747.

Sincerely,

Raymond L. Orbach
Director

cc: N. Narain, Brookhaven Site Office
L. Newman, BNL
K. Fox, BNL

Department of Energy
Washington, DC 20585
June 19, 2006

MEMORANDUM FOR DISTRIBUTION

FROM: RAYMOND L. ORBACH
UNDER SECRETARY FOR SCIENCE

SUBJECT: Laboratory Directed Research and Development

On April 19, 2006, the Department issued DOE Order 413.2B, "Laboratory Directed Research and Development." The DOE Order has been updated to reflect recent reorganizations within DOE and improvements in our management practices, as well as to comply with new reporting and oversight requirements as a result of Government Accountability Office reviews and specific Congressional direction.

While DOE Order 413.2B provides a concise statement establishing policy requirements, the more specific oversight procedures for laboratory directed research and development (LDRD) have been developed through a coordinated effort led by the Office of Science (SC) and the National Nuclear Security Administration (NNSA). The attached document provides a consolidated set of roles, responsibilities and guidelines for LDRD conducted at the DOE/NNSA laboratories. It replaces all LDRD guidance previously issued by SC.

If you have any questions, please contact John LaBarge of my staff at (202) 586-9747.

Attachment

cc:
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Roles, Responsibilities, and Guidelines for Laboratory Directed Research and Development at the Department of Energy/National Nuclear Security Administration Laboratories

1. PURPOSE

1.1. This document augments DOE Order 413.2B, Laboratory Directed Research and Development (LDRD). It establishes the roles, responsibilities, and guidelines for implementing the requirements of DOE Order 413.2B at the Department of Energy (DOE)/National Nuclear Security Administration (NNSA) laboratories.

2. ROLES and RESPONSIBILITIES

2.1. The Director, Office of Science, or designee:

2.1.1. Establishes Departmental policy in the form of DOE Order 413.2B and is the focal point for policy clarification and issue resolution.

2.1.2. Establishes and chairs the LDRD policy review committee that consists of members from the Office of Science, Office of Nuclear Energy, and NNSA.

2.2. Cognizant Secretarial Officer (CSO)/Deputy Administrator for NNSA or designees:

2.2.1. Exercise oversight of all LDRD activities at the laboratories for which they have oversight responsibility, with assistance from the responsible Site Office Manager or designee;

2.2.2. Review and approve the annual program plan and maximum funding level that may be expended or obligated on LDRD activities for the next fiscal year at each laboratory for which they have oversight responsibility; and notifies the DOE Site Offices and the laboratories in writing of the approved maximum funding levels before the beginning of the new fiscal year;

2.2.3. Annually review the laboratory LDRD programs for which they have oversight responsibility as described in Attachment 1: LDRD Program Review;

2.2.4. Grant exceptions to the policy of a maximum period of performance of 36 months for an LDRD project, with assistance from the responsible Site Office Manager or designee. Extension of a project beyond the normal 36-month limit is restricted to unusual circumstances with strong justification;

2.2.5. Conduct additional reviews, as necessary, in conjunction with the responsible Site Office, to ensure compliance with this Order and other LDRD-related requirements and/or for preparing the approval of the program plan and maximum funding level;

2.2.6. Assign additional general or specific tasks to the responsible Site Office, with their agreement, to ensure adherence to the requirements of DOE Order 413.2B; and

2.2.7. Chair their respective LDRD Working Groups that consists of members from the responsible site offices and associated laboratories.

2.3. DOE/NNSA Site Office Managers or their designees:

2.3.1. In conjunction with the CSO/NNSA Deputy Administrator for NNSA,

2.3.1.1. exercise oversight of the laboratory's LDRD activities, as required by DOE Order 413.2B;

2.3.1.2. oversee the implementation of the laboratory's LDRD management system and the general administrative aspects of LDRD activities;

2.3.1.3. assist in the annual review of the LDRD program as described in Attachment 1: LDRD Program Review;

2.3.2. Review the laboratory's proposed annual LDRD plan and funding level and provide a written recommendation on the plan and requested funding level to the responsible CSO/Deputy Administrator for NNSA;

2.3.3. Provide a written certification that the laboratory's method for accumulating LDRD funds meets the requirements of DOE Order 413.2B, and submit it to the CSO/Deputy Administrator for NNSA either before the recommendation on the LDRD Plan and requested funding level or with this recommendation;

2.3.4. Review each individual LDRD project data sheet, assess the proposed project's compliance with DOE Order 413.2B, and concur or withhold concurrence:

2.3.4.1. within 30 calendar days from date of receipt of the project data sheet for each individual project that will start work at the beginning of the fiscal year;

2.3.4.2. within 10 working days from date of receipt of the project data sheet for each individual late-start project (i.e., those projects that begin after October 1); or

2.3.4.3. within 10 working days from the date of receipt of the project data sheet for each individual project requesting a cumulative budget increase of greater than or equal to 50 percent over the DOE approved amount or $200,000, whichever is less. Cumulative budget increases up to $25,000 do not require concurrence;

2.3.5. As necessary, provide additional assistance to the CSO/Deputy Administrator for NNSA in fulfilling the requirements outlined in DOE Order 413.2B, including active participation in the appropriate LDRD Working Groups;

2.3.6. Provide the responsible CSO/NNSA Deputy Administrator for NNSA with a written concurrence for any project for which the laboratory requests an exception from the policy of a maximum period of performance of 36 months for an LDRD project; and

2.3.7. Conduct special reviews, audits, and assessments as necessary to ensure compliance with DOE Order 413.2B and for continuous improvement.

2.4. The Laboratory Directors or their designees:

2.4.1. Guide the laboratory's LDRD program to support the overall mission and goals of the laboratory consistent with the requirements of DOE Order 413.2B;

2.4.2. Ensure that all LDRD projects support the DOE national security missions (energy resources, nuclear security, environmental quality, and science), and to the extent required by law, support missions of other federal agencies;

2.4.3. Fully support all LDRD review and oversight activities and participate in the LDRD Working Groups;

2.4.4. Comply with the DOE Order 413.2B requirements as stated in the Contractor Requirements Document of this Order;

2.4.5. Submit an annual LDRD program plan, as described in Attachment 2: Reporting Requirements, for approval to the CSO/Deputy Administrator for NNSA and the responsible Site Office Manager at least 45 days before the start of the fiscal year;

2.4.6. Submit an annual LDRD report, as described in Attachment 2: Reporting Requirements, to the CSO/Deputy Administrator for NNSA and the responsible Site Office Manager within 6 months after the end of the fiscal year;

2.4.7. Submit a data sheet, as described in Attachment 2: Reporting Requirements, to the Site Office Manager for every project selected by the laboratory. For projects intended to begin at the start of the fiscal year, these data sheets should be submitted at least 30 days prior to the start of the fiscal year to allow at least 30 days for review by the DOE/NNSA Site Office manager or designee; for late-start projects, data sheets may be submitted at any time.

2.4.8. Submit a data sheet, as described in Attachment 2: Reporting Requirements, to the Site Office Manager for a project requesting a cumulative budget increase of greater than or equal to 50 percent over the DOE approved amount or $200,000, whichever is less. Cumulative budget increases up to $25,000 do not require concurrence.

2.4.9. Keep documentation on file for each approved LDRD project to show that the project has undergone proper review and is in compliance with all applicable requirements;

2.4.10. Respond to DOE/NNSA, Congressional, or auditor inquiries or requests for information in a timely manner; and

2.4.11. Support the annual LDRD Program Review (see Attachment 1) as instructed by the CSO/Deputy Administrator for NNSA.

Attachment 1. LDRD Program Review

DOE/NNSA LDRD Roles, Responsibilities and Guidelines

The LDRD Program Review is a process, conducted annually between May and September, that evaluates the laboratory's compliance with DOE Order 413.2B, the LDRD program results, and the operation of the laboratory's LDRD management system, including the project selection process. The annual review in conjunction with the reasonableness of the LDRD Program Plan, the Site Office's recommendation, and the laboratory's overall performance in managing its LDRD program, forms the basis for the decision on the laboratory's LDRD program plan and maximum level of funding for the next fiscal year.

The annual review includes submittal of a program assessment for the prior fiscal year by the laboratory to the CSO/Deputy Administrator for NNSA and the DOE/NNSA Site Office Manager. This assessment may be submitted as a separate document or included in the annual report or annual program plan as agreed upon by the laboratory and the CSO/Deputy Administrator for NNSA and the responsible Site Office Manager. The assessment includes the following:

- A statement from the laboratory director or designee affirming the quality of science and engineering, program relevance, and adherence to compliance requirements for the LDRD program;
- A description of the laboratory's LDRD management process;
- A description of the peer review process by which the LDRD research is evaluated;
- A financial overview;
- A summary of the LDRD portfolio's relatedness to laboratory initiatives and strategic plans;
- A summary of the performance indicators listed in Attachment 3; and
- An assessment of the program's value to the laboratory and DOE and, if any, proposed areas for improvement

As part of the annual review, each CSO/Deputy Administrator, NNSA or designee conducts a meeting attended by representatives of the DOE/NNSA site offices and the laboratories. The depth to which each laboratory program is reviewed at this meeting is determined by the CSO/Deputy Administrator, NNSA or designee and will be commensurate with the size of the program and its history of compliance and effectiveness. Generally, each laboratory review includes the following:

- A review of the administrative/management structure of the program (current and changes for the upcoming fiscal year);
- Prior fiscal year program technical accomplishments;
- Current fiscal year program expected technical accomplishments; and
- Proposed technical program activities for the next fiscal year.

Attachment 2. Reporting Requirements

DOE/NNSA LDRD Roles, Responsibilities, and Guidelines

1. Annual Program Plan

The plan shall provide the following:

1.1. requested funding level;

1.2. general description and justification of the LDRD program; and

1.3. an explanation of how the LDRD program will meet laboratory needs; support the DOE national security missions (energy resources, nuclear security, environmental quality, and science), and to the extent required by law, support missions of other federal agencies.

2. Annual Report

The annual report consists of a brief program overview and individual technical reports for each project active during the reporting period. The report may be submitted as printed matter or electronic files using generally available media and formats such as Portable Document Format (pdf) files on CDs. Each laboratory must also provide a report on completed projects to the Office of Scientific and Technical Information. The format for the annual report is as follows:

2.1. Brief program overview including annual program costs and number of projects; and a discussion of how the program will meet laboratory needs and support the DOE national security missions (energy resources, nuclear security, environmental quality, and science), and to the extent required by law, support missions of other federal agencies.

2.2. Project Summaries

2.2.1. a general description of the project including objectives and purpose;

2.2.2. a summary of the scientific or technical progress achieved during the life of the project; and

2.2.3. a brief statement describing how the project benefited the DOE national security missions (energy resources, nuclear security, environmental quality, and science), and to the extent required by law, the missions of other federal agencies.

3. Project Data Sheets

Data sheets are submitted annually for each project to the responsible DOE/NNSA Site Office Manager or designee for concurrence. The purpose of a project data sheet is to provide DOE with sufficient background and technical information on which to base concurrence. Project data sheets will provide the following information:

3.1. Laboratory name

3.2. Fiscal year for which concurrence is being requested

3.3. Project identifier

3.4. Project title

3.5. Principal investigator

3.6. Responsible project manager

3.7. Project description: include a short description of the project and an explanation of the cutting edge, high-risk, high-potential science or engineering

3.8. Tie to mission: explain the project's relevance or anticipated benefits to DOE's national security missions (energy resources, nuclear security, environmental quality, and science), and to the extent required by law, the missions of other federal agencies.

3.9. Previous year's accomplishments and results (as applicable)

3.10. Work proposed for next year and anticipated/desired results

3.11. Project funding profile, broken down by FY, including prior- and current-year funding, next year's budget being requested for concurrence, future funding as applicable, and total projected cost. The example in the table below is for a data sheet of a FY 2005 concurrence request.

Fiscal Year	Amount ($)
FY 2003 (prior-year costs)	
FY 2004 (current-year budget)	
FY 2005 (next year's budget, concurrence requested)	
FY 2006 (projected budget)	
FY 2007 (projected budget)	
Total estimated budget	

Annual Project and Laboratory Data

Each laboratory annually provides project and laboratory data as described below.

4.1. CFO Database Upload

Annually, at the beginning of each fiscal year, as requested by the Office of the Chief Financial Officer, each laboratory is required to provide the following information for the previous fiscal year.

4.1.1. For each LDRD project:

4.1.1.1. Laboratory name

4.1.1.2. Project title

4.1.1.3. Project identifier

4.1.1.4. Total fiscal-year costs in dollars

4.1.1.5. Point of contact (normally the laboratory's LDRD manager)

4.1.1.6. Phone number of point of contact

4.1.1.7. Type of work (basic research, applied research, or development)

4.1.1.8. Start date

4.1.1.9. Expected completion date (optional)

4.1.1.10. Description of Project (optional)

4.1.2. Laboratory-wide cost information:

4.1.2.1. LDRD-supported administrative costs (any costs that were not charged to LDRD research and development projects)

4.1.2.2. Laboratory costs for each DOE program, the Department of Defense, the Department of Homeland Security, and all other reimbursable work. All costs are reported on a fiscal-year basis and include both operating and capital equipment, but not construction. This requirement is subject to change from year to year as the DOE programs and offices change.

4.2. Other laboratory-wide information

The following information is required annually for the report to Congress. It is not part of the CFO database upload

4.2.1. Number of postdoctoral researchers supported by LDRD

4.2.2. Number of postdoctoral researchers supported by all laboratory programs

4.2.3. Number of dollars provided by defense programs to LDRD

4.2.4. Number of dollars provided by nondefense programs to LDRD

4.2.5. Number of dollars provided by DHS programs to LDRD

4.2.6. Sum of fiscal-year budgets of LDRD projects expected to support defense programs

4.2.7. Sum of fiscal-year budgets of LDRD projects expected to support nondefense programs

4.2.8. Sum of fiscal-year budgets of LDRD projects expected to support DHS programs

Attachment 3. Annual Performance Indicators

DOE/NNSA LDRD Roles and Responsibilities Guidance

All indicators are to be reported on a fiscal year basis. For indicators 4-7, it is expected that the laboratories will collect this information for LDRD projects going back at least 3 years (i.e., the fiscal year being reported and the two preceding years).

1. Number of postdoctoral researchers supported in full or in part by LDRD during the fiscal year.
2. Number of students supported in full or in part by LDRD during the fiscal year.
3. Number of full-time scientific and technical research staff hired as a result of full or partial LDRD support during the fiscal year.
4. Number of LDRD-derived refereed publications (e.g., journal articles, conference papers, book chapters, or other reports) published during the fiscal year. This indicator includes all publications derived in whole or in part from LDRD projects funded in any year.
5. Number of LDRD-derived invention disclosures filed during the fiscal year (disclosures are internal laboratory intellectual property documents). This indicator includes all disclosures derived in whole or part from LDRD projects funded in any year and all subsequent LDRD follow-on activities.
6. Number of LDRD-derived patents issued/granted during the fiscal year. This indicator includes all patents derived in whole or part from LDRD projects funded in any year and all subsequent LDRD follow-on activities.
7. Number of LDRD-derived copyrights (other than publications) issued/granted during the fiscal year. This indicator includes all copyrights derived in whole or part from LDRD projects funded in any year and all subsequent LDRD follow-on activities.

In addition to the numerical data requested above, please provide information on any national awards or recognition received during the fiscal year that are attributable in whole or in part to LDRD projects funded in any year. For each award, describe (in 150 words or less) its significance and the role that LDRD played in achieving it.

BNL Council
FY07 LDRD Proposal Selection Process

FY07 LDRD Selection Committee Members:

5 ALDs

HENP/CSC	P. Bond
LIFE	R. Henn
NSLS	S. Dierker
BES	D. Gibbs
EENS	R. James

5 BNL Council Members

HENP/CSC	D. Kharzeev
LIFE	D. Schlyer
NSLS	R. Pindak
BES	T. Sears
EENS	L. Kleinman

L. Newman
P. Looney

May 8, 2006

Abstracts of all proposals were sent to all the selection committee members and members were asked to indication their interest in proposals as Highly interested, Moderately interested, No interest.

BNL Council Members were recused from all proposals in their Department or proposals in which they had a conflict of interest, such as being a co-PI or collaborator, or for which they felt they could not give an unbiased evaluation

May 15, 2006

Selection committee members returned the proposal spreadsheets indicating their level of interest for each proposal (unless recused).

May 23, 2006

A spreadsheet with assignments based on levels of interest was generated. Selection committee members might be assigned a proposal that they were not interested in as in some cases no one showed an interest in reviewing a given proposal. ALDs, as the most qualified experts, were listed as the Primary Proponent (P1) for all proposals in their Directorate. L. Newman and P. Looney served as Third Proponents (P3) for all proposals. ALDs also served as Second Proponents (P2) for approximately 25% of the proposals in other Directorates. Each Council Member served as a Second Proponent for approximately 20% of the proposals, with at least half of these coming from outside their respective Directorates. Hence, each proposal was assigned to 5 Reviewers: Directorate ALD (P1), another ALD (P2), a Council Member (P2), L. Newman (P3), and P. Looney (P3).

The proposals were rated on the basis of 4 to 1, where a 4 indicated fund at all costs, a 3 indicated fund, a 2 indicated fund if money is available, and a 1 indicated do not fund. Only integers were used.

BNL Council
FY07 LDRD Proposal Selection Process

Complete proposals were sent to Committee Members listed as P1 or P2 proponents. Committee Members could request the full proposal of any proposal including those from which they have been recused. However, Council Members were not informed prior to the meeting that they would be able to comment on the proposals from their Department.

June 30, 2006

The spreadsheets with proposal ratings were returned to L. Newman.

July 14, 2006

The Selection Committee met for a full day. The proposal ratings were summed and, this year, fell into three distinct groupings. The Selection Committee were asked to approve without discussion the highest ranked proposals (3%) that fared so well that their approval would be certain. The ALDs were then asked to reject, without discussion, the proposals with scores so low that approval would not be forthcoming (49%). It was proposed and accepted that any proposal in this category, which was ranked 4 by a Selection Committee Member, be discussed. This resulted in 57% of the submitted proposals being discussed and 40% rejected without discussion.

The proposals were grouped by ALD so that the ALD could emphasize those proposals of choice during their presentations. The ALD was limited to 5 minutes per project and an additional total of 5 minutes was allocated for presentations by those who were assigned as 2Ps and for discussion by the group as a whole.

Following the discussion, there was a call for revised or new ratings from each member of the committee. Note, in some cases, a Committee Member's rating is based on reading the abstract of the proposal and the short verbal discussion during the meeting.

There were a total of 88 Proposals broken down by Directorate as follows:

EENS – 29
BES – 18
LIFE – 14
NSLS – 8
HENP/CSC – 16/3

August 2, 2006

The proposals were regrouped by Lenny Newman according to ratings from the July 14 Meeting and put into four categories: Approve Without Discussion (3%), Discuss (34%), New Reject Without Discussion (16%), Original Reject Without Discussion (47%). The spreadsheet of regrouped proposals was emailed to all Committee Members on August 2. Prior to the regrouping 2 ALDs had requested that 2 proposals be moved into the Discuss category. In addition to regrouping the proposals a number of budget reductions were proposed. These reductions were in-part generated from discussions at the previous meeting, but were largely an effort by Lenny Newman to spread the LDRD budget among a larger number of proposals. Prior to the next meeting, ALDs had an opportunity to discuss the budget reductions with the PIs. Committee Members were reminded to come to the next meeting prepared to discuss the budget reductions.

BNL Council
FY07 LDRD Proposal Selection Process

August 7, 2006

The LDRD Selection Committee held its second meeting. The reasons why 2 lower-ranked proposals were moved into the Discuss category were described and judged to be valid.

At this point, there were 33 proposals left in the Approve without Discussion and Discuss categories. The breakdown of these were BES (10), EENS (8), LIFE (6), NSLS (4) and HENP/CSC (5/0). Since the LDRD budget was only sufficient for about 2/3 of the number of proposals, each ALD was asked to pick the top proposals based on their priorities. This left the following number of proposals tentatively allocated for each Directorate.

EENS – 5
BES – 6
LIFE – 4
NSLS – 3
HENP/CSC – 4/0

The ALDs were then asked to select this number of proposals from the longer list and to justify why these proposals were their highest priority and if the budget adjustments made by Lenny Newman were reasonable or not. At this stage, the quality of the science in the proposals received very little discussion, since it was assumed that the quality of the science had been vetted at the previous meeting and the focus was on how each proposal fit into the strategic plan of the Directorate. At the end of this process, there was still some money left, so each ALD was asked to choose an additional proposal for their directorate. One proposal (from EENS) was approved and the ALDs ranked the additional proposals that were next in line for funding by secret ballot. In the end, 26% of the LDRD proposals were approved by the ALDs. The final selection is subject to the approval of the Lab Director and local DOE Office.

NOTE: only ALDs can vote on whether or not to approve a proposal

Summary Table

Directorate	# Proposals Submitted	# Recommended Full Panel	# Proposals Approved
EENS	29	8	6
BES	18	10	6
LIFE	14	6	4
NSLS	8	4	3
HENP/CSC	16/3	5/0	4/0

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D. Kharzeev
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managed by Brookhaven Science Associates
for the U.S. Department of Energy

Date: December 13, 2006

To: Samuel Aronson

From: BNL Council

Subject: LDRD Selection Process

The BNL Council recognizes a number of positive aspects of the BNL LDRD selection process including the fact that the goals stated on the LDRD web site are laudable, the selection meetings are run efficiently and effectively, the selection process gives priority to tenure-track scientists, the process encourages interdepartmental projects, each Directorate is given an equal opportunity to compete for funding, the process is open and involves scientific staff participation. These aspects of the selection process should be preserved; but, as with most established procedures, the BNL Council believes that the quality of the LDRD Selection Process could be improved. Specifically, we identified six deficiencies in the current LDRD Selection Process and propose improvements. These improvements were approved by a majority of the BNL Council members.

Deficiency #1:

The BNL Council is like the House with a variable representation from each Directorate to represent the full range of programs within each Directorate, while the Council members on the LDRD Selection Committee are like the Senate with only one representative for each Directorate. Since the BNL Council members on the LDRD Selection Committee do not have expertise that necessarily covers all the subfields within their Directorate, the Council members on the Selection Committee feel inadequate to review a subset of the proposals that they are assigned.

Proposed Improvement #1:

One solution is to add additional BNL Council members to the LDRD Selection Committee to provide better coverage of all subfields; however, to keep 'equal' involvement of all Directorates would require 5 additional members. This would make the scheduling of meetings, which is already difficult, impossible.

A more practical solution is to keep the current number of BNL Council members on the Selection Committee but encourage the BNL Council members, serving on the LDRD Selection Committee, to consult with any BNL Council member who could provide an 'expert' opinion on an LDRD proposal that the LDRD Selection Committee member has been assigned to rate. This would enable the BNL Council member on the LDRD Selection Committee to be a stronger advocate for the proposal and involve the entire BNL Council, with a wide range of expertise, in the process.

Deficiency #2:

In FY06, approximately 40% of the proposals were rejected 'without further discussion' and the identification of these proposals was strongly influenced by the ratings of Pat Looney and Lenny Newman who had 40% of the vote. In the subsequent process, Pat and Lenny, by their own admission, did not try to 'drive the process'. The BNL Council members thought that the latter approach was correct, but were puzzled why this 'guideline' wasn't followed from the beginning.

Proposed Improvement #2:

The favored solution is to remove the LDRD Director from the initial proposal rating process, but retain the Director as a voting member of the selection process during the discussion phase. During the selection committee discussions, the LDRD Director plays the important role of ensuring that the selected proposals are balanced between the three areas that the LDRD's promote, namely lab wide initiatives, Directorate specific initiatives, and excellent science. The LDRD Director, having read through all of the proposals, is in the best position to maintain this balance.

A second solution is that the proposal rating that is done prior to the first meeting of the LDRD Selection Committee should be weighted according to the familiarity of the reviewers with the PI's research program, i.e. the ratings of the proponents should be highest for first proponent (PIs ALD), next highest for the second proponents (ALD from a different Directorate than the PI and the BNL Council scientific staff member), and lowest for the third proponents (Pat Looney and Lenny Newman). A possible weighing scheme is (3.0, 2.0, 1.0).

Deficiency #3:

Council members were assigned some proposals to review that they had expressed 'no interest' and had no expertise yet were recused from reviewing other proposals, which were in their field on which they were not co-PIs.

Proposed Improvement #3:

BNL Council Member participants in the LDRD Selection Committee should not be recused from reviewing proposals from their own department unless they are co-PIs or have a conflict-of-interest. The Council Members will assume responsibility for recusing themselves when appropriate.

Deficiency #4:

Although BNL Council members of the LDRD Selection Committee were advised that they could request the full version of any submitted proposal, this provides an unnecessary barrier for having access to all proposals for which the Council member could advocate.

Proposed Improvement #4:

Prior to the first meeting of the LDRD Selection Committee, BNL Council Member participants should be provided with full proposals of all the LDRD proposals submitted by their department since they are in the best position to provide an expert assessment of these proposed research projects during the discussion at the first meeting. Unless specifically assigned one of these department proposals for review, Council members do not rate these proposals prior to the first Selection Committee meeting. It would also be advantageous for all LDRD proposals to be on a password protected web site.

Deficiency #5:

The LDRD SBMS web page does not include a description of the LDRD Selection Process. This leaves it to imagination of the scientific staff regarding how the LDRD selections are made and can result in misinformation and lack of confidence in the selection process.

Proposed Improvement #5:

A detailed description of the LDRD Selection Procedure should be added to the LDRD SBMS web pages.

Deficiency #6:

The BNL Council finds that, although LDRDs that directly support new BNL research initiatives or meet ALD initiatives to build new research programs within their Directorates are clearly important, these should not be overemphasized to the point of excluding LDRDs that propose exciting new and potentially high-impact research not associated with an existing initiative. These forward-looking research projects are an essential long-term investment for BNL.

Proposed Improvement #6:

A way to address this issue is to specifically ear-mark a fraction of the LDRD funding for exciting new and potentially high-impact research not associated with existing initiatives. Another approach is to emphasize in the LDRD SMBS guidelines that forward-looking research of potentially high-impact is one of the main criteria used in the selection process. Since they do not have a research agenda to promote, the BNL Council members should serve as advocates for this type of LDRD proposal.

Follow-up Discussions with Pat Looney and Lenny Newmann.

When the list of LDRD deficiencies and improvements were presented to Pat Looney by Ron Pindak as Council representative, Pat was in basic agreement with the proposals and suggested that to help implement the proposed improvements the BNL Council should prepare a document that describes the role played by the BNL Council in the LDRD Selection Process as well as describes the BNL Council's responsibilities. The responsibilities should include confidentially in handling proposals and clearly define what constitutes a 'conflict of interest'. Pat also asked that the BNL Council consider the level of funding for LDRD proposals. In recent years, the level of funding for the majority of LDRD proposals is only adequate to fund the research of a single post-doc making the LDRD a program that largely funds post-docs rather than a program that also funds larger-scale interdepartmental research efforts involving several post-docs or PhD students. The Council agrees to provide the requested document and discuss the LDRD funding level in the near future

When the list of LDRD deficiencies and improvements were presented to Lenny Newmann by Ron Pindak as Council representative, Lenny was also in basic agreement with the proposals. Lenny emphasized the importance of his role as a voting member during discussion phase because of the effort that he puts into reviewing each and every proposal.